



Faculty of Applied and Creative Arts

DEVELOPING MOBILE APPS FOR BLOOD DONATION

LIEW PUI SUN

Bachelor of Applied Arts with Honours

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DEVELOPING MOBILE APPS FOR BLOOD DONATION

LIEW PUI SUN

This project is submitted in partial fulfillment
of the requirement for the degree of Bachelor of Applied Arts with Honours
(Design Technology)

Faculty of Applied and Creative Arts
UNIVERSITI MALAYSIA SARAWAK

2018

UNIVERSITI MALAYSIA SARAWAK

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Final Year Project Report

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CONTENTS

	Page
Title page	
Declaration	i
Verification	iii
Acknowledgement	iv
Content	v
List of figures	xi
Abstract	xv
<i>Abstrak</i>	xvi

CHAPTER 1 INTRODUCTION

1.1 Background	1
1.2 Problem Statement	5
1.3 Research Question	7
1.4 Research Objectives	7
1.5 Scope of Study	7
1.6 Limitation of Research	8
1.7 Significant of Study	8

CHAPTER 2 LITERATURE REVIEW

2.1 Blood Donation	9
2.2 Blood Donation Mobile Apps	10
2.3 Blood Donation Process	11
2.4 Mobile Apps User Experience	12
2.5 User Interface Design	13
2.6 Service Design	15
2.7 Mobile Apps Usability	16
2.8 Blood Donation User Experience	17
2.9 Donor Behavior	19

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Primary Data	20
3.1.1 Interview	20
3.1.2 Observation	21
3.1.3 Journey Map	21
3.1.4 Empathy Map	23
3.2 Competitor Analysis	24
3.3 Visual Analysis	25
3.4 Secondary Data	26

3.4.1 Journal	27
3.4.2 Visual References	27

CHAPTER4 RESEARCH METHODOLOGY

4.1 Interview	28
4.1.1 Donor Interview	28
4.1.2 Service Provider Interview	31
4.2 Empathy map	33
4.3 Observation	35
4.3.1 Non-Participant Observation	35
4.3.2 Participant Observation	38
4.4 Journey Map	39
4.4.1 Journey Map for Donor	39
4.4.2 Journey Map for Service Provider	40
4.5 Competitor Analysis Map	41
4.6 Visual Analysis	42

CHAPTER 5 DESIGN PROCESS

5.1 Introduction	43
5.2 Concept Design	43

5.3 User Task Model for Donor	44
5.3.1 Blood Donation Registration	45
5.3.2 Emergency Case	45
5.3.3 Event Notification	46
5.3.4 Donation Rewards	46
5.4 User Task Model for Service Provider	47
5.4.1 Record Donor Data	47
5.4.2 Scan QR Code	47
5.4.3 Event Update	48
5.5 Design Development	48
5.5.1 Sitemap	49
5.6 Wireframe	50
5.6.1 User Wireframe	51
5.6.2 Service Provider Wireframe	51
5.7 Visual Design Proposal	52
5.7.1 Logo Character Design	53
5.7.2 Button & Icon Design	54
5.7.3 Color Scheme	55
5.7.4 Typography	56
5.8 User Interface Design	56

5.8.1 Splash Page	57
5.8.2 App Guide	58
5.8.3 Main Features	58
5.8.4 Side Features	60
5.9 Service Provider Interface Design	63
5.9.1 Main Features	63
5.10 Software & Prototype	64
5.11 Promotion & Strategy	64
5.11.1 Social Media and apps store	65
5.11.2 Traditional Advertising	67
5.11.3 Merchandise	68
5.11.4 Collaboration	69
 CHAPTER 6 VALIDATIONS	
6.1 Validation	70
6.2 Method	71
6.3 Findings	71

CHAPTER 7 RECOMMENDATIONS & CONCLUSION

7.1 Recommendation	72
7.2 Conclusion	72

REFERENCES	74
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APPENDIX

Appendix 1: Interview survey form (Donor)	78
Appendix 2: Interview Survey Form (Blood donation Service Provider)	85
Appendix 3: Donor/ Service Provider Interface Validation	88
Appendix 4: Sketches and Idea development	89
Appendix 5: Compilation of donor empathy map	90
Appendix 6: Compilation of service provider empathy map	91
Appendix 7: Design development 1	92
Appendix 8: Design development 2	93

LIST OF FIGURES

Figure 1.1 The blood components in whole blood donation

Figure 1.2 Examples of blood donation mobile apps in local and overseas

Figure 1.3 The situation of blood donation in Malaysia

Figure 1.4 Examples of messages that viral on social media

Figure 2.1 Logo of Pusat Darah Negara

Figure 2.2 Logo of Apps Store

Figure 2.3 Flow chart about blood donation process

Figure 3.1 Sample of Journey map

Figure 3.2 Sample of Empathy map

Figure 3.3 Sample of Positioning mapping

Figure 3.4 Company comparison table

Figure 4.1 Compilation of Empathy map result from donors

Figure 4.2 The location of event in Summer mall, Kota Samarahan

Figure 4.3 The location of events in Summer mall, Kota Samarahan

Figure 4.4 The red book to record donor donation history

Figure 4.5 The registration forms before blood donation

Figure 4.6 The place of walk-in blood donation in Hospital Umum Sarawak

Figure 4.7 The journey map result by self-experienced

Figure 4.8 The result of journey map for service provider

Figure 4.9 The competitor analysis map for blood donation apps

Figure 4.10 The visual analysis map for blood donation apps

Figure 5.1 Mood board for visual research

Figure 5.2 Task Model of Donor Use Online Form to Fill-in Data

Figure 5.3 Task Model for Donor Share an Emergency Case

Figure 5.4 Task Model for Donor Get Notification about Blood Donation Event

Figure 5.5 Task Model of Donor Claim the Rewards

Figure 5.6 Task Model of Service Provider to Record Data

Figure 5.7 Task Model of Service Provider to Scan QR Code

Figure 5.8 Task Model of Service Provider to Update Event

Figure 5.9 Hero user sitemap

Figure 5.10 Hero service provider sitemap

Figure 5.11 Hero user wireframe

Figure 5.12 Hero service provider sitemap

Figure 5.13 Drafts Hero Logo Design

Figure 5.14 Final Hero Logo Design

Figure 5.15 Draft Character Design

Figure 5.16 Final Character Design

Figure 5.17 Side Button & Icon of Hero app

Figure 5.18 Main Button & Icon of Hero app

Figure 5.19 Color scheme of Hero app

Figure 5.20 Typography of Hero app

Figure 5.21 Splash Page of Hero app

Figure 5.22 App Guide Pages of Hero app

Figure 5.23 First Main Page of Hero app

Figure 5.24 Second and Third Main Page of Hero app

Figure 5.25 Fourth and Fifth Main Page of Hero app

Figure 5.26 Side Page of Hero app

Figure 5.27 Rewards Page of Hero app

Figure 5.28 E-articles Page of Hero app

Figure 5.29 Main Features of Hero Service Provider app

Figure 5.30 Event Update Page of Hero Service Provider app

Figure 5.31 Social Media Advertising (Facebook, Instagram, Official Website)

Figure 5.32 Demo video about Hero App

Figure 5.33 Apps store Advertising & QR code

Figure 5.34 Traditional Advertising (Ambient)

Figure 5.35 Traditional Advertising (Brochures)

Figure 5.36 Merchandise items

Figure 5.37 Grab discount voucher

Figure 6.1 Result of validation

Abstract

Blood is the most precious thing that anyone can give to any one in need. A decision to donate blood can help to save life. Blood Hero is a special design mobile application to make the blood donation process more efficient and convenience. Blood Hero also provides a platform for public to share their news and emergency case. In addition it provides two interfaces for donor and service provider which allows both of them to update information and news synchronously. A method used in this research is quantitative while the target respondents are blood donor and service provider. The main purpose of this research is to find out the problems and needs during the blood donation. Hero apps aimed to enhance the efficiency of the blood donation process and in addition to create awareness and to encourage others to be a blood donor.

Key Words: Blood donation, Mobile app, Efficient, Awareness

Abstrak

Darah adalah perkara yang paling berharga yang boleh diberikan kepada mana-mana orang yang memerlukan. Keputusan untuk menderma darah dapat membantu menyelamatkan nyawa lain. Blood Hero merupakan aplikasi mudah alih yang direka khas untuk menjadikan proses derma darah lebih cekap dan mudah. Blood Hero juga menyediakan platform untuk orang ramai untuk berkongsi berita dan kes kecemasan mereka. Di samping itu ia menyediakan dua antara muka untuk penderma dan penyedia perkhidmatan yang membolehkan kedua-dua mereka mengemaskini maklumat dan berita serentak. Kaedah yang digunakan dalam kajian ini adalah kuantitatif manakala responden sasaran adalah penderma darah dan penyedia perkhidmatan. Tujuan utama penyelidikan ini ialah untuk mengetahui masalah dan keperluan semasa proses menderma darah. Aplikasi Hero bertujuan untuk meningkatkan kecekapan proses derma darah. Selain itu, ia bertujuan untuk mewujudkan kesedaran dan menggalakkan orang ramai untuk menderma darah.

Kata Kunci: Derma Darah, Aplikasi Mobil, Kecekapan, Kesedaran

CHAPTER 1

INTRODUCTION

1.1 Background

“1 pint of blood could save up to 3 lives” (Ruxyn T., 2017)

Blood is the most important elements in our body because blood occupied around 7-8% of weight in our body. It functions as transport oxygen and nutrient to every cell and vital to human immune system to prevent virus attacks (Ding, 2015). Blood donation is a volunteer way which can save people life and help them when they are in emergency or people who need blood transfusion. With the advances in medical technology and the increase of hospital will cause the requirement of blood become higher. Based on Sim, D.N. (2017) declared that blood play an important role for medical and surgical treatment such as cardiac surgery, organ transplantation and etc. There are many types of blood donation process according to the medical needs and countries technology.

The history of blood donation is started in 1818 year which is the first successful human blood transfusion happened. There are many blood transfusion failures continuously because lack of knowledge and research until 1901 year. A German scientist Dr. Karl Landsteiner found out there are 4 different blood types in human red cells which are the cause of unsuccessful blood transfusion. In the beginning, scientist study the blood preservation is for wounded soldiers during the World War I. Afterwards, there is a breakthrough in World War II which freezes technique and plastic blood bags were discovered. The first blood bank was organized at

Chicago's Cook County Hospital in 1936. Firstly, blood transfusions only provided for wounded 2 soldiers but more and more blood bank opened across the country to provide blood transfusion for patients (Ding as cited in American's Blood Center 2012).

According Kementerian Kesihatan Malaysia (2017) stated that there are two types of blood donation in Malaysia which is whole blood donation and apheresis donation. The whole blood donation is the most common of blood donation in Malaysia which will process in the laboratory after the donation and break into 3 components plasma, platelet concentrates, and packed red cells. It will take around 30 min to complete the donation and can be donate as frequent every 3 months. The process of apheresis donation is separate the plasma and platelets by machine but the time to complete an apheresis donation is around 30-45 min for plasmapheresis and 45-75 min for plateletpheresis. Donor can donate more frequent compare with whole blood donation which is every 2 weeks.



Figure 1.1 The blood components in whole blood donation

(Source: www.myhealth.gov.my)

Based on Ruxyn, T. (2017), a health donor can donate again after 56 days. But Ministry of Health Malaysia stated that the awareness of blood donation is still low among Malaysia population which is only 660,000 (2.2%) of donor for whole Malaysian population in 2016 which is recruit at least 5% for developed countries. According to the statistics by National Blood Centre (PDN) of Malaysia, there are 3000-3500 units of blood are distribute weekly to general or private hospitals for patient regular usage and this does not include the emergency supplies needed such as accidents or specific cases. Even though the target can't be achieved yet, but the total number of donor in Malaysia have a steady increase over the years. The blood bank also said that the blood type of "A" was dangerously low supply while others still moderate supply for "B" and "AB" blood types. Only the "O" blood type was in normal supply which is the most common blood type among Malaysian. But Malaysia blood bank always needs more to continue the supply (Kaur, 2016).

Malaysia National Blood Centre is named as National Blood Bank (Pusat Darah Negara) which is Malaysia's premiere blood Centre. The Blood Banks also strict the donor selection process to make sure the quality of donated blood is comply with standard. Blood donation really can come out with many benefits for Malaysian. Besides that, if donate blood under National Blood Centre (Pusat Darah Negara) or associated hospitals can also gain a lot of benefits like free health checkup, hepatitis B vaccination, and first class hospital wards and so on. But need to donate blood a certain amount of times to gain all this benefits. Some donor donates blood also because of altruism spirit, pursue by their friends and relatives or just want to help people in need. But in opposite, from the journal of Social Administration said there are also some unawareness of blood donation because of many reasons like scare, busy, blood phobia or discouragement from family members will block them to join the blood donation. (Misdi, 2016)

The existing method to donate blood can be defined walk-in or mobile blood donation. The Kementerian Kesihatan Malaysia has conducted a mobile blood donation programs for public so that can make the donation process easier and help them to know the latest location of blood donation. Furthermore, there are also have provided official hotline for public to look for further information or ask question for where or when to donate blood at the nearest hospital or events.

There are many available blood donation mobile apps in local or foreign. For example “My blood” mobile apps is an official mobile apps developed on collaboration between UTM (Universiti Technology Malaysia) and PDN (Pusat Darah Negara) which provides alert on donation eligibility and blood donation locations. The upcoming events also will be provided through push the messages and event notifications on the main interface for user. Overseas blood donation mobile apps such as “Blood donor” mobile apps which developed by The American Red Cross Blood and “Friends2support.org” mobile apps which have world’s largest voluntary blood donor online database.

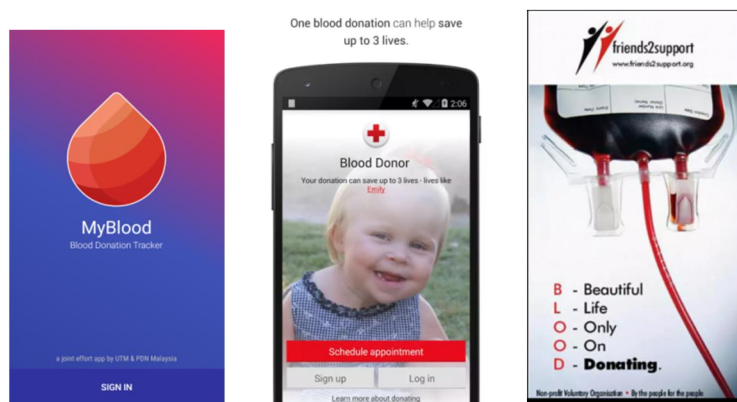


Figure 1.2 Examples of blood donation mobile apps in local and overseas

(Sources: Google)

As conclusion, blood donation is an important ways to help people when emergency and the demand of bloods will not be stopped. In this year, World Blood Donor Day 2017 theme is “What can you do? Give blood. Give now. Give often.” So that, public should build up the awareness about how important of blood donation and take it as social responsibility while government also have to find out the easiest way to simplify the procedure or find a way to attract more donor to donate blood.



Figure1.3 The situation of blood donation in Malaysia

1.2 Problem Statement

According to the official website Kementerian Kesihatan Malaysia (2017), mobile blood donation program have conduct actively by government such as offices, buildings, factories and shopping centers besides use blood donation at blood banks. There are also some corporation between government and non-government organization (NGOs). When public have any problem or need further information on blood donation mostly have to call their nearest hospitals or National Blood Centre hotline. Even though there is an official mobile app for Pusat Darah

Negara which provides information, location or notification on the upcoming events. Mostly, public will use social media such as Facebook status or photo to post for requesting blood donation of certain location or blood type. User in social media just can help to viral which only limit between friends and family and cannot spread the urgent condition and not fully understand about the situation completely. Hard to find suitable and match blood type also the problem faced when emergency.

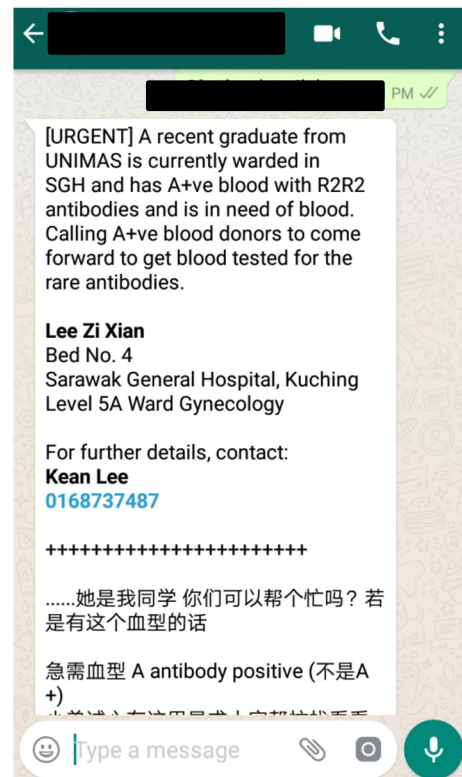


Figure 1.4 Examples of messages that viral on social media

1.3 Research Question

- Which is the convenient way to make announcement when emergency needs blood donate or have blood donation event?
- What is the convenient way needed by donor when they want to donate blood?
- What are current existing functions and interface of blood donation apps in the market?
- How to improve the features and interface of blood donation mobile apps?

1.4 Research Objectives

- To investigate the current existing problem faced in blood donation.
- To identify the problem faced by donor when want to donate blood.
- To produce a new interface and features of blood donation mobile apps to user
- To validate the blood donation mobile apps

1.5 Scope of Study

The scope of study for blood donation mobile apps is focus on the layout and interface of visual design. Learn the functionality of the current existing blood donation mobile apps to know where to improve instead of functions. Besides, have to understand the location of blood donation especially hospital or event to investigate the situation and the process of blood donation. Lastly,

studies the field of blood donation also need because have to know the basic knowledge of blood donation.

1.6 Limitation of Research

The limitation of this research is hard to find a complete statistics about the blood donation and only can take from the newspaper or articles which is not complete or just a part of it. Furthermore, the mobile apps of blood donation also need specific and professional coding to complete it, hence this research only focus on the interface layout design and its functions only show in prototype level only.

1.7 Significant of Study

The study of blood donation mobile apps can simplify the process of blood donation and make it more efficient on saving time and process for donor and collector. This blood donation mobile app also can help to promote or create awareness to the public about the important of blood donation.

CHAPTER 2

LITERITURE REVIEW

2.1 Blood Donation

Blood can be defined as the most important because it can help people to save lives. Blood transfusion always needed in many situations such as cardiovascular surgery, save people who are injured in accident or natural disasters. Anyone might have possibility lying on the operation or waiting blood transfusion from someone. So that, blood donation can be consider as social responsibility for everyone.

Firstly, blood donation can receive a whole bunch of benefits such as can help to weight loss and good for health. It also helps to balance the iron levels in human blood and stimulates the production of the new blood cells. The risk of the cancer and heart attack diseases also can be decrease.

In Malaysia, a group of women volunteers from Red Cross British has originated Blood Bank Services in 1955. At that time the donor members are police, military and government personal. After that, the due to the high requirement, blood move to Hospital Kuala Lumpur in 1971 which named as “National Blood Service Centre” (National Blood Centre, 2017).



Figure 2.1 Logo of Pusat Darah Negara
(Source: www.myhealth.gov.my)

2.2 Blood Donation Mobile Apps

The rise of the mobile technology is at the peak level of growth that cannot be argued. Today society and economic system have influenced people to interact with mobile technology effectively. The development of WAP-based blood donation cans convenience donors and collector to apply blood donation to solve the problem that faced in traditional blood donation (Goh et al., 2006). There are 4 popular smart phone platforms for users to download which are Google Play, Apple Apps store, Blackberry App World and Windows Mobile App store. There are also approximately around 20,000 medical iOS apps and 9,000 medical apps available for Android.

Regarding to Ouhbi et al. (2015) said that the result that come out have shown that most of the available apps used to help to search donors. Blood donation apps are useful for donor when needs and in case of emergencies condition. Furthermore, the blood donation app market also influence from the needs of blood donation and also the usage of smartphone users. As conclusion, there is a necessary for build up better blood donation apps with more features to

attract more volunteer donors. So, information of blood donation apps can be defined as popular service in smart cities.

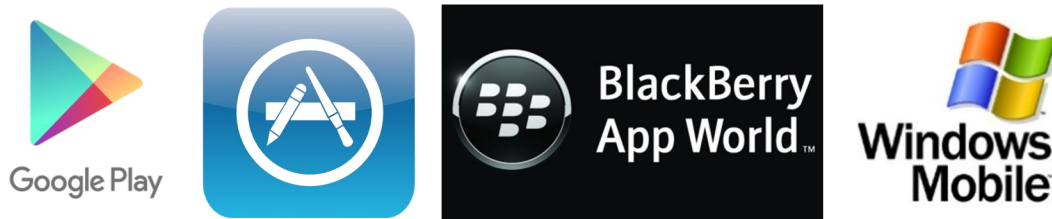


Figure 2.2 Logo of Apps store

(Sources: Google)

2.3 Blood Donation Process

Service design is type of improvement service about service's quality and interaction for users. Kementerian Kesihatan Malaysia (2017) has stated that the whole completed processes of blood donation are like below:

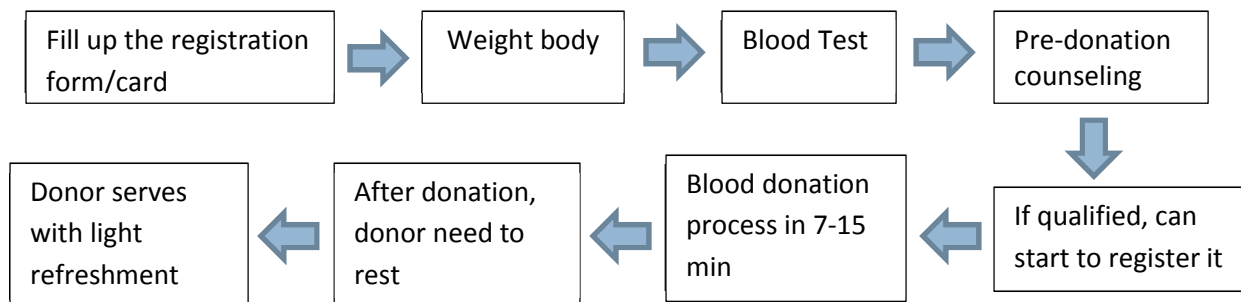


Figure 2.3 Flow chart about blood donation process

Basically, the function of blood donation service design is allowing more people to access it so that can increase donors in the population. Blood donation service should be in digital form

because of the broad adoption of mobile technology in digital age. So that the innovation of the blood donation mobile apps is needed to wake up the awareness of blood donation to attract young donors, and retain people who have donated before and also regular donors. The aim is to recruit more donor and also services to make it more convenience and efficient as well in operation system to give a new impression for donors. (Ding, 2015)

Based on Ding (2015) research said there is a positive result about people are generally volunteer to help but they just look for an opportunity. This shows that the main problem is not the blood transfusion process but how to wake up awareness and increase opportunities to donate blood in order to let people more easy access the services. Lastly, the most important thing is when people are ready to help, don't let service inconvenience to block their action.

2.4 Mobile Apps User Experience

U.S Department of Health & Human Services (2017) stated user experience (UX) is a way to understand about users need, value, abilities and also limitations. UX is mostly for promote to improve the quality of user interaction and some related services and product for ourselves. So that, there are many factors that influence UX like useful, usable, desirable, findable, accessible and credible.

According to Gallagher (2017), mobile user experience UX design consider as positive experiences when mobile devices is wearable or services running on devices. Mobile UX design is more focus on efficiency and discoverability. To build up a positive and personally meaningful

experience, UX designer should discover the operation and co-operation with other devices or services.

Many things have to be consider when design mobile apps and also some general guidelines as UX considerations; mobile specific design should be include as consideration too. Therefore, there are some basic considerations for design mobile apps. Foth et al.(2013) have stated that enhance the content appropriately on visual design, tone of voice or transitions. Second, make sure to keep the navigation and exploration simple, for example blood donation apps have to provide a clear navigation to view locations of the user's closest donation center. Third, apps should focus on sign-up, sign-in and update personal details to simplify the form fill in process. For blood donation apps should be persistently logged-in to provide a track of individual donation behavior through donation history including charts, obtain user details, behavior and transaction history. Lastly, the features of widgets and notifications and appointment booking facilitation have to take as consider too.

As conclusion, UX principles are an optimization framework fix up to smartphone mobile apps. It need many considerations and idea when access an apps to improve the user experiences UX. The customer journey, conversion point and usability testing also covered inside.

2.5 User Interface design

User interface (UI) design is graphical user interface design on software like the look of the mobile apps. It focuses on ease of use and accessible, understand and facilitate of actions for user.

There are many concepts bring UI together like interaction design, visual design and information architecture (U.S Department of Health & Human Services, 2017).

There are a lot of interface elements that should consistent and affirmable about the layout. Examples of the interface elements should be include in mobile apps:

- **Input Controls:** Buttons, Date field, Text field, List boxes, Check boxes
- **Navigational Components:** Search field, Slider, Pagination, Tags, Icons
- **Informational Components:** Tooltips, icons, Progress Bar, Notifications, Message boxes, modal windows

Design an interface should consider on keep the interface simple and create consistency with UI elements. Plan properly in page layout based on importance because it can help to draw attention and increase the readability. Typography can help to create hierarchy by using different sizes, arrangement and fonts. (U.S Department of Health & Human Services, 2017)

According to The Usability Post (2009), there are a lot of characteristics for various interface design that can be crafting for user interfaces and websites. Follow the guidelines from experts and professional can help us to create a good user interface. Hence, there are 8 characteristics of successful user interface which are Clear, Concise, Familiar, Responsive, Consistent, Attractive, Efficient and Forgiving.

2.6 Service Design

Service design is a kind of take concepts on many ranges like user experience, marketing or project management in order to fulfill the user to optimize new services. The existing service can be improved from scratch. Before that, the basic principles of service design thinking have to understand it so that able to creating services. (Lazier, 2017)

These are the 5 principles of service design which user-centered, co-creative, sequencing, are evidencing and holistic (Lazier, 2017). First, the user-centered is about the center user of the service design, blood donation project service center user can be considering as blood donor. Second, co-creative is about who should be involving especially peopling who are parts of the service. For blood donation mobile apps there are two types of people involve which are public (donor) and service provider (blood collector). Third, principle of sequencing is the service has to be virtualizing it by using empathy mapping or journey map for blood donation mobile apps. Forth, evidencing can help to create loyalty and let user to understand the service experiences. Last, holistic is the entire of the services which is important. Regarding to Ding (2015), the service blood donation nowadays still use outdated communication channel like email, phone calls and poster to out to potential donors.

Many tools of the trade which involved in user experience (UX) are parallel with the service design. Examples of the service design tools are Personas, Customers journey map and service blueprinting (Lazier, 2017). Based on Ding (2015), customer journey map is highlight the user needs, questions, feelings through their experience with the blood donation service.

2.7 Mobile Apps Usability

Usability means to make the products and system more friendly used and more user friendly for needs and requirements. It also represent as effectiveness, efficiency and satisfaction for a product or service.

To figure out the problem of mobile apps usability has to use usability testing by testing it with real users. Usually users have to complete tasks to overcome the usability issues. Many type of usability testing are available like comparative usability testing and explorative usability testing. Blood donation mobile apps are using comparative usability testing because there are many types of blood donation apps peers in the markets (Ding, 2015). After that, usability evaluation has to do it for new or updated services neither pre nor post-launch. This is to ensure that problem or issues are take note and fixed before the apps is launched (U.S Department of Health & Human Services, 2017). Based on Ouhbi et al.(2015), many studies have proven about the intention of enhance the usability within the context of it. The limitation of mobile application such as small screen size, connectivity issues and input modalities will affect the usability of mobile apps.

Besides, the field of blood donation app behavior should enhance with some elements such as how to utilize picture to convert ideas, adaptation of app on horizontal and vertical orientations, improvement of structure and etc. Based on Sholapure (2016) has shown that one of the top blood donor mobile applications- Bloodline. It functions is enables to connect blood donors by using social media and location. For collector also provide a list of donors to get ready for emergency time.

On the other hand, the element of usability for apps is platform usability. It is very important since nothing is frustrating than an app cannot function on user specific model of phone. Incentives for sharing and purchase also consider as the consideration of mobile apps. Thus, improving usability needs constant conversation and optimization for the apps. Next, make sure there is easier for navigation to prevent users click many times to complete an “app transaction”. Create a relevant content which is personalized for site user. Besides, aesthetics of the mobile apps can engage users to a deeper level on interaction and sensation. Complete information with auto-filled customer data can brings convenience to users. The last usability element is quick movement with small screen can simplified the user experiences (Interaction Design Foundation, 2017).

In a nutshell, when the mobile apps can fulfill the needs and expectation from their user, it can consider successful develop a service or mobile apps.

2.8 Blood Donation User Experience

Blood donation user experience is a type of way in term of how easy and convenience to use it and opinion. User experiences can help to understand more about user’s desire or supplement and know about user expectation on blood donation mobile apps. According to Ding (2015), said that build up new features with new concepts for new app in blood donation is very hard and limited. But it is greater to focus on crafting a better experience based on the previous one. This can help to go deeper and better if use the existing structures and mockup. The reasons

are because blood donation service includes many medical issues and regulations which have to be considering it and couldn't be simply change it.

Basically, there are many factors that influence the user experience of the mobile apps. The factor of useful is important to be able to compete for public attention with purposeful and useful products. Usability is concerned about user is able to achieve their objective with a product. Next factor is referring to the finable element. Build an app's content must be easy to find in the instance of digital and information form. Establish user credibility relates to users trust our product that we've provided. Furthermore, desirability is expressed about the image, branding, identity and aesthetics design while accessibility is related to provide experience to user with full range of abilities about the product. At the same time, every business must deliver value to create user to use it. Create value is the initial success for a product to be remembered.

The blood donors and receivers always lack of communications and understanding during the blood donation service interaction. Their connection only filled by blood donation service and hospitals. However, reconnect the relationship for donor and receiver would be a design opportunity to make an improvement on it (Ding, 2015). Sholapure (2016) also stated people should consider two main characteristics to choose blood donation apps which are can work when offline and location independent in any location.

2.9 Donor Behavior

Cannot denied that blood donation is a habitual manner for Malaysian and one 2.2% of the whole population to donate their blood. Theories of behavior also state that individual behavior in blood donation influenced by three main things which are belief of the attitude, belief that influenced by others and control beliefs (Misdi, 2016).

Blood donation is a complex issue with many factors such as health, age, education, culture and etc. can influence their decisions. The communication sections with donor and non-donor have come out the reasons for donate blood and not. Even though money can be a motivator but it is not a long-term strategy and the biggest motivation should be the desire to help others (Ding, 2016).

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Primary Data

According to Grimsley, S.(2013), primary data is the information that collected and received specifically for the purpose of the research or study. The population sample of the source is from the data that we collected. There are many methods to collect the primary data which are interview, survey, observation and so on.

3.1.1 Interview

Interview sections divide by 2 groups of respondents which consist of donor and service provider. The type of interview chosen for this method is structured interview format. The reason to use this type of method is because standardized the questions make the interview process efficient. The aim of interview is to get a comprehensive understanding about respondent needs and opinion about blood donation. There are 2 groups of respondents which are organizers of blood donation campaign, staff nurse from General Hospital Sarawak and medical officer who experience in blood donation. The donors also categorized as first time donor, non- active donor and regular donor. The interview session will take place at Blood Bank-General Hospital Sarawak, Summer mall blood donation event and Student Pavilion UNIMAS blood donation event. Questions related to background of respondent, blood donation and opinion about blood donation apps will be ask during the session. The interview session will be recorded using a voice

recording device and will be analyzed and conclude based on their similarities, significant differences or important keyword.

3.1.2 Observation

The types of observation that involved are naturalistic observation and participant observation. Reasons that choose naturalistic observation is because it will be able to observe the flow of the whole process and behavior in own setting studies. Thus, the benefit of use participant observation is allow researcher to gain empathy by self-experiences. This will provide more understanding on the problems, meaning and viewpoints. The location that chosen are blood bank Hospital Umum Sarawak (mobile weekday/walk-in), blood donation campaign at Summer mall and student pavilion UNIMAS (mobile weekend). Duration of the observation is estimated around half an hour at each place to complete it. It will be recorded and analyzed by flow chart. The aim of observation at blood donation campaign destination is to analysis the situation and process of blood donation; Observation at Blood bank Hospital Umum Sarawak can differentiate the processing way between the walk-in mobile and weekend mobile.

3.1.3 Journey Map

Journey map is a tool to understand customer's experience by full cycle of journey which about the ways of customer achieves their needs and understand customers need. The journey map focuses on donor and service provider. The benefit of journey map is help to understand

customers' emotion and learn which aspect is truly satisfied by customers. In particular, journey map can help to identify the gaps in customer service or communication. Journey map will be recorded through notes taking. The journey map will focus on three blood donation stages from pre-blood donation, donation (service journey) and post blood donation period. Respondent experiences, expectation and satisfaction will also be included in the journey map.

Journey Map

Note:

Pre-Blood Donation Period	Donation Period	Post Blood Donation Period
	SERVICE JOURNEY	
Service provided		Service provided
Experiences:	Expectations:	Satisfaction:

Figure 3.1 Sample of Journey map

The location for this method will take place at 2 location which are mobile weekend (blood donation event) and also walk-in donation (Blood bank Hospital umum Sarawak). The main focus of journey map is the service journey during the blood donation about the time period and blood donation procedure details. Most important part of journey map is to focus on donors experiences and feeling throughout the whole blood donation process. The journey map also

provided space to fill in experiences, expectations and satisfactions to express feeling and opinion during the blood donation process. This session will takes around half hour to complete it.

The journey map for service provider is recorded at blood donation event and blood bank. It will focus on the procedures of walk-in blood donation registration in blood bank Hospital Umum Sarawak. By understanding their service procedure step by step researcher can identify their problems and issues during the whole process.

3.1.4 Empathy Map

Empathy map can be defined as a customer segment of understanding opinion and feeling when involves in the environment much like a user persona. It is more cares about user feeling, emotion and sensation feel. Empathy map helps in term of providing from customer's perspective in the context of their own worldview. Empathy map will be used as mean to record conversation between researcher and the respondents where they will be ask about their feelings throughout the blood donation process from pre donation, donation and post donation.

Empathy Map

	Before donation	Donation	After donation
Think and feel			
Hear			
See			
Say and do			
Pain:		Gain:	
Note:			

Figure 3.2 Sample of Empathy map

3.2 Competitor Analysis

Competitor analysis is a marketing evaluation plan for apps which can establish what makes my service become unique and attractive. According to the competitor analysis can accurately estimate my mobile apps weakness and strangeness compare with others apps competitor. The evaluate way is categories them according to their marketing position and strength through competitor analysis map. The apps that included in competitor analysis are Redy and My Blood (Pusat darah negara official apps) which is local blood donation apps. Meanwhile, the foreign apps are Friends2support and American Red Cross.

The positioning map is used to analysis the competitors. It is a diagrammatic technique to display different perceptions of customers to find out their strengths. Mostly, the position is displaced with company's identity or brand which is relative to their competitor. This map cans visually analysis their weakness and strengths from different expect.

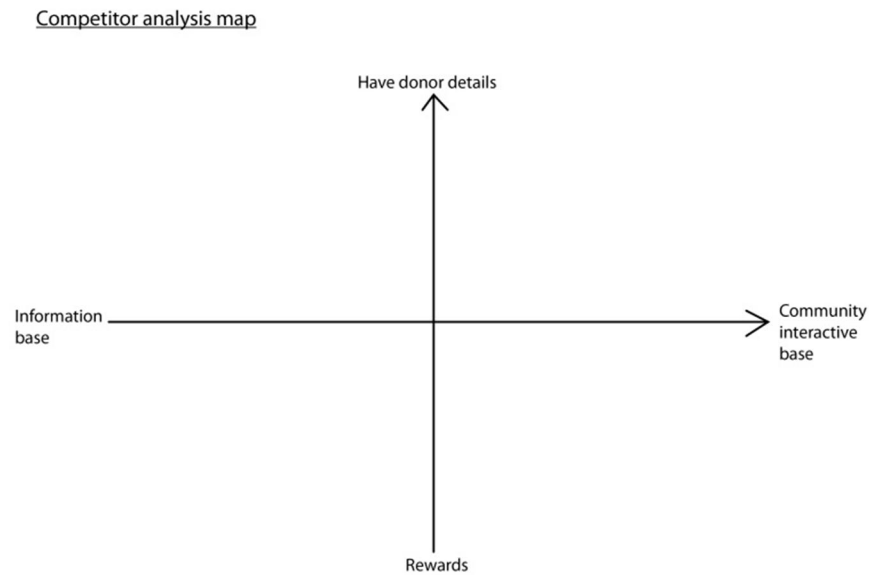


Figure 3.3 Sample of positioning mapping

3.3 Visual Analysis

A visual analysis can be addresses as study and interpreted the artwork's visual elements such as color, texture, line and so on. The best way to understand competitors design style and graphic elements is analysis their company by comparison between each other. There are 4 brands to complete a comparison table which are Redy, My Blood (Pusat darah negara official

apps), Friends2support and American Red Cross. Each of them will be compared with different elements such as interface design, color scheme, icon and style.





logo	Interface design	Color	Button&Icon	style
				
				
				
				

Figure 3.4 Company comparison table

3.4 Secondary Data

Secondary data refers to the information was collected or wrote by someone which are readily available (Management Study Guide, 2018). Usually the sources of secondary data are organizational records, data and censuses. This is important because it can make primary data become more specific by make out the gaps and deficiencies. Besides, it helps to us to understand more about the problem and provides basic data comparison which is collected by researcher.

3.4.1 Journal

Online journal is related to a particular subject with professional activity. There are long list of distinct advantages of using online journal for example it provided case studies which are good sources of information and knowledge. It also very easy to access and offers wide variety of databases. The journals that I chose for research are “Journal of Social Administration” and “Principle of Mobile App Design” and so on.

3.4.2 Visual References

Visual reference is a perceptible by the sense of visual and sight. It can provided ideas and inspiration for the design. Use the visual references to modify the look and feel can make the design more mature and professional because we still unskilled and inexperienced.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Interview

4.1.1 Donor Interview

The respondents that involved in donor interview section were 2 first time donors, 3 non-active donors and 3 regular donors from different age ranges and occupations. There were 9 respondents involved.

In part section A is asked about background of respondent.

	Name	Gender	Age	Job scope
<i>Respondent 1 (First time donor)</i>	<i>Safiah</i>	<i>Female</i>	<i>22</i>	<i>Student</i>
<i>Respondent 2 (First time donor)</i>	<i>Lilian</i>	<i>Female</i>	<i>24</i>	<i>Work (self-employee)</i>
<i>Respondent 3 (Non-active donor)</i>	<i>Ariff</i>	<i>Male</i>	<i>36</i>	<i>Government functionary</i>
<i>Respondent 4 (Non-active donor)</i>	<i>Fazilah</i>	<i>Female</i>	<i>23</i>	<i>Student</i>
<i>Respondent 5 (Non-active donor)</i>	<i>Chan</i>	<i>Female</i>	<i>22</i>	<i>Student</i>
<i>Respondent 6 (Regular donor)</i>	<i>Tey</i>	<i>Female</i>	<i>23</i>	<i>Student</i>
<i>Respondent 7 (Regular donor)</i>	<i>Tiang</i>	<i>Male</i>	<i>43</i>	<i>Engineer</i>
<i>Respondent 8 (Regular donor)</i>	<i>Vivian</i>	<i>Female</i>	<i>25</i>	<i>Student</i>

In section B, questions are about blood donation

1.	<i>What motivate you to join the blood donation campaign?</i>
----	---

As conclusion about 8 respondents opinion, most of them think that there are many benefits for blood donation such as can help people in needs, well for health and contribute to society. These are the reasons why they willing to join blood donation.

2.	<i>How do you know about the blood donation campaign?</i>
----	---

Regular donor mostly will regularly go to hospital to donate blood but they might also join the event if they heard it or pass by. Basically for the first time and non-active donor they majority knew the blood donation event from social media post like Facebook and Instagram. Some of them also saw the advertisement and poster around the area of blood donation events .Few people saw it on university's noticeboard.

3.	<i>What problems do you struggles during the process of blood donation?</i>
----	---

Common and major problem identified through this interview are the register process. Blood donor has to line up for register and fills in form which took quiet sometimes for them. But minority of donor did not face any problems during the whole process of donation because they think that the procedure of donation is still considered smooth.

In section C, questions are about donor opinion

1.	<i>Have you heard about blood donation mobile apps?</i>
----	---

Basically, there are majority of the blood donor haven heard about blood donation but some have heard it before. This situation can be concluding that blood donation mobile apps still consider unfamiliar for public.

2.	<i>Have you use the blood donation apps before? What your opinion about it?</i>
----	---

Even though most of them didn't hear and use it before, but they are willing to use it if got a chance to use it. Some donors have saw at apps store but they didn't download to use it because they didn't understand and familiar with it.

3.	<i>Do you think that blood donation mobile apps are useful and bring convenience?</i>
----	---

Can be concluded that most of the respondents think that blood donation mobile apps is useful because can provide information and notification about blood donation campaign for donor. When emergency cases, it also provide a platform for people to viral their status.

4.1.2 Service Provider Interview

The respondents that involved in service provider interview section were 1 organizer of blood donation, 1 medical officer and 1 staff nurses from Blood bank Hospital Umum Sarawak.

In part section A is asked about background of respondent.

	Name	Gender	Age	Job scope
<i>Respondent 1</i>	<i>Nusaibah</i>	<i>Female</i>	<i>28</i>	<i>Medical officer (pre-counseling)</i>
<i>Respondent 2</i>	<i>Shanti</i>	<i>Female</i>	<i>18</i>	<i>Organizer (PBSM SMK Kota Samarahan)</i>
<i>Respondent 3</i>	<i>Tauti</i>	<i>Female</i>	<i>34</i>	<i>Staff nurse</i>

In section B, questions are about blood donation

1.	What type of media use to promote blood donation?
----	---

According to the respondent comments, the most important media for service provider to promote blood donation are social media like Facebook to spread the event to the public. But sometimes, they will use traditional media to advertise their events for example newspaper or poster.

2.	When emergency cases happen, how to promote to public to collect blood?
----	---

Basically, service provider are using back social media to viral the news of emergency but they will ask patient family to viral it themselves too. Besides, they will use their computer system to contact the person who has rare blood type to help the people need rare blood type.

3.	What problem faced during the blood donation process and is the process smooth?
----	---

In conclusion, the blood donation events consider under control even though sometimes more crowded people. Mostly only big event need to line up because of the limited space and staff to handle it but small events consider everything under control.

4.	Is there any follow-up conducted to donor after blood donation?
----	---

Actually, there are many precautions need to take note after blood donation. Mostly, staff nurse will give donor advices and suggestion after blood donation so that donor will take care themselves for instance no heavy staff, no exercise and drink more water on that day. At the end, staff nurse will encourage them to come back donate again.

In section C, questions are about opinion about blood donation mobile apps

1.	What do you think about blood donation mobile apps?
----	---

Most of them no idea about the blood donation mobile apps and never heard about it before because there are still not in trend in Malaysia. Mostly, they have no idea about it.

2.	Do you think blood donation apps is useful and bring convenience?
----	---

As result, all the respondents are giving positive review about blood donation apps because they think that blood donation mobile apps may bring a lot of conveniences and features for public. It may good for everyone.

4.2 Empathy Map

The empathy map only involve blood donor only. Basically, empathy map can identify and analysis their needs and idea during the whole process of blood donation. There are 8 respondents which are 2 persons of first-time donor, 3 persons of non-active donor and 3 persons of regular donor to fill in it.

Empathy Map			
	Before donation	Donation	After donation
Think and feel	scare phobia excited want to try can help people	feel uncomfortable actually not pain is ok so enjoy feel boring	calm excited feel ok vomit fainted
Hear	just a bit pain not horrible can help people go ahead	hear people talking nurse ask them relax	take more rest no heavy staff drink water hear advice and prompt from nurse
See	long line up people donate blood saw people scare	daze celling watch phone	see people rest take light refreshment
Say and do	take courage to join challenge myself challenge myself scare pain during donation	scroll phone talking with friend talking with nurse Do nothing	eat light refreshment go back home
Pain: pain scare nervous		Gain: proud great can help people good experience	

Note:

Figure 4.1 Compilation of Empathy map result from donors

Before the blood donation:

The result of the empathy map can be conclude that most of the first time donor will feel scare and nervous but for regular donor and non-active donor just feel normal and usual when donate blood. The first time donor will hear about blood donation is very scary and someone will encourage by their friends to join the donation. Basically, some donors are just joining the events as casual but some of them really know about the event and specially come to the event. First time donor will take the first step to join the donation and staff nurse will try to calm and encourage them.

During the blood donation:

Majority of the donor are just feel normal and relax during the blood donation but the first time donor mostly feel scare before the injection, after that they will felt boring during the blood transfusion. During the blood donation they will hear that staff nurse will communicate with them to make them relax. Afterwards, they just see the ceiling and daze. But some donor will talk with their friends or play phone during the blood transfusion.

After the blood donation:

After the blood donation process finish, great majority of the donor felt OK and good condition but some of them will fainted and vomit. Before donors left, they can get some light refreshment from the organizer. They will hear some advice and prompt from nurse and can take some souvenir and merchandise to bring back home.

Gain and pain after the blood donation:

In conclusion, mostly donors feel great and proud of themselves because can help people when donate blood even though they may felt scare and pain at first. Donors had good experiences about it and they thought that will back again for donation. As regular donor, they just usual during the donation because for them donation is habit and become nature already. So, the empathy map can concluded that most of the donor are feeling well and high acceptance about blood donation.

4.3 Observation

4.3.1 Non- Participant Observation

The locations that I observed for blood donation campaign are student pavilion UNIMAS and Summer Mall shopping Centre on date 28 and 29 October 2017 (Saturday & Sunday). The observation duration took around half an hour at each location. According to my observation, both of the two places were having the same procedure and process of the blood donation. But the campaign that held at student pavilion UNIMAS is more crowd compare with Summer mall blood donation campaign so that there was a longer line up and need to wait for turn. Both two places are almost around 50-80 participants to join the event. Majority of the participant are female but event at student pavilion UNIMAS mostly average age is 18-25 years old. But Summer mall event average age is 20-45 years old. The peak times of both events are during the rest hours which are 12pm to 2 pm because participants join the event after lunch.



Figure 4.2 The location of events in Student Pavilion, UNIMAS



Figure 4.3 The location of events in Summer mall, Kota Samarahan

The red book will be given to every donor to record their blood donation history. Each of the donation will marked inside this small red book and donor has to bring along this red book during every donation.

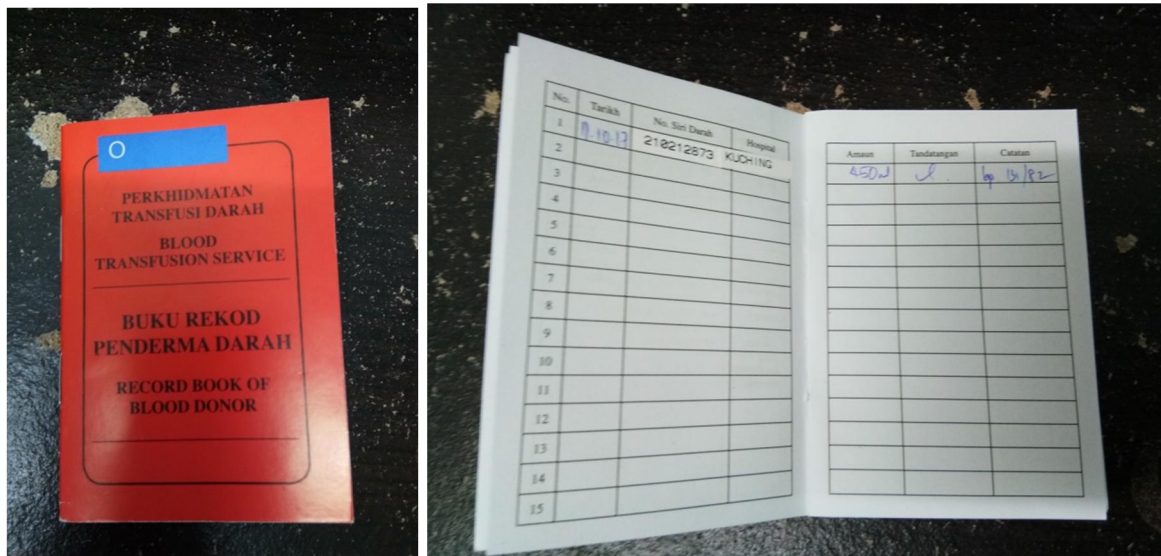


Figure 4.4 The red book to record donor donation history

There are 4 pages of forms need to fill in before donor start to donate blood, but only the first page about personal information need donor to fill in first before proceed to pre-counseling part. After that, staff nurse will fill in page 2-3 by themselves because they have to reconfirm the donor health status to make sure the blood is usable after donate.

Figure 4.5 The registration forms before blood donation

4.3.2 Participant Observation

A participant observation was conducted at Hospital Umum Sarawak blood bank on date 2 of November (Thursday). In this participant observation, I took the role as walk-in blood donor. The duration of the observation at blood bank took around one hour. Based on the observation, the first thing to do prior the blood donation is to fill in form at the registration counter. According to my observation about that place, before enter into the blood donation part; there was a counter for pre-donation which was corner to fill in forms and register counter. Afterwards, proceed to next part which was hemoglobin test and weight body. Next step is to go to the pre-counseling section and blood pressure checking. After that, can proceed to the steps of donate blood. As conclusion, the walk-in blood donation process is very smooth and almost each donor can straight away precede all the steps without waiting because there was many staff nurses stood by. In comparison between walk-in donation and weekend donation, walk-in donation machines for donation was more complete compare with campaign donation. For example, walk-in donation will use the machine to sway blood but blood donation campaign staff nurse will use hand manually sway it. The chair also more advanced at blood bank which will automatically move up and down but the chair at blood donation campaign was portable.



Figure 4.6 The place of walk-in blood donation in Hospital Umum Sarawak

4.4 Journey Map

4.4.1 Journey Map for Donor

The journey map was my own experience as a donor in blood donation campaign that held at Summer mall. The whole journey map took around an hour to complete it. Inside the journey map also stated some services provided during the whole blood donation process such as scale to weight body weight, light refreshment and staff nurses will give advice after the donation. The experiences during the donation process are before the donation feel scare but after donation feeling not well and the donation actually not pain. The expectations on this experience were good. But the satisfaction is can success to donate blood and feel proud.

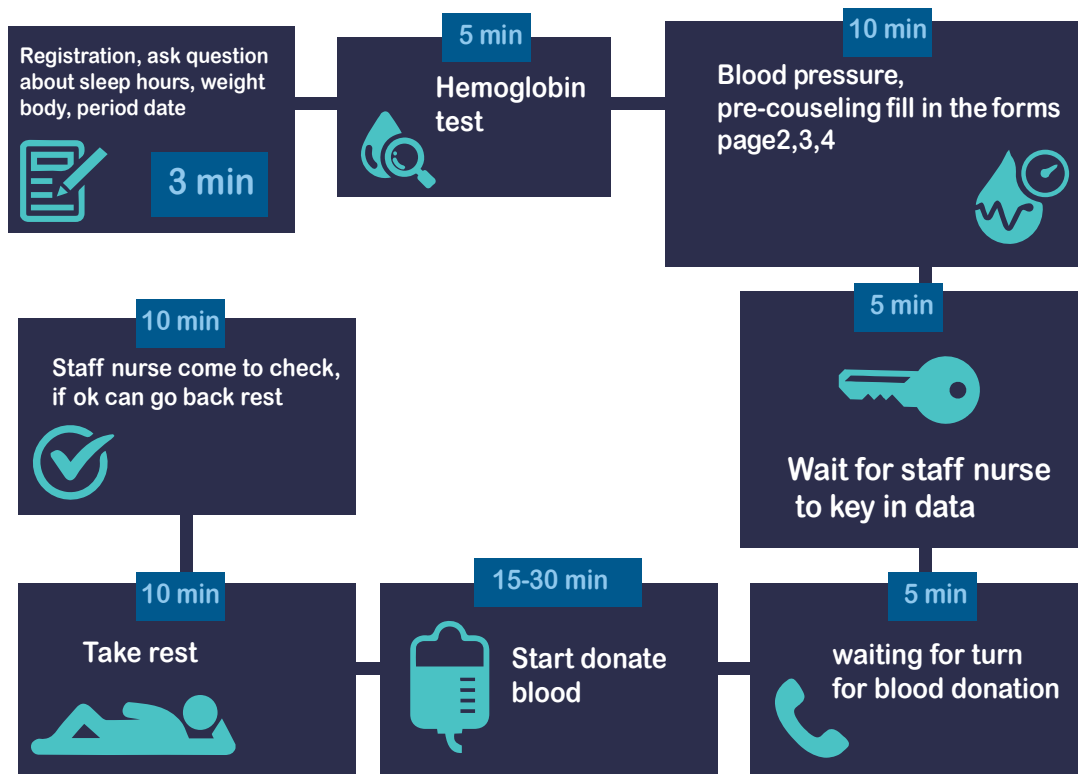


Figure 4.7 The journey map result by self-experienced

4.4.2 Journey Map for Service Provider

The journey map was recorded about the blood bank staff actions for registration parts in Blood Bank Hospital Umum Sarawak. The whole process of duration took around 15 min to complete it. The staff nurse will record donor identity and check their basic information to make sure donor can donate after that will proceed to pre-counseling section. Medical staff also stated that the part of pre-counseling questions have to ask donor and cannot be skip because infection cannot be detected and donor have to conscience about their body condition to prevent harm the blood receiver. Donor also must be honest to answer the question. Even though some of the steps can be skipped but there are some sensitive question that have to be double confirm to make sure the blood is usable and harmless.

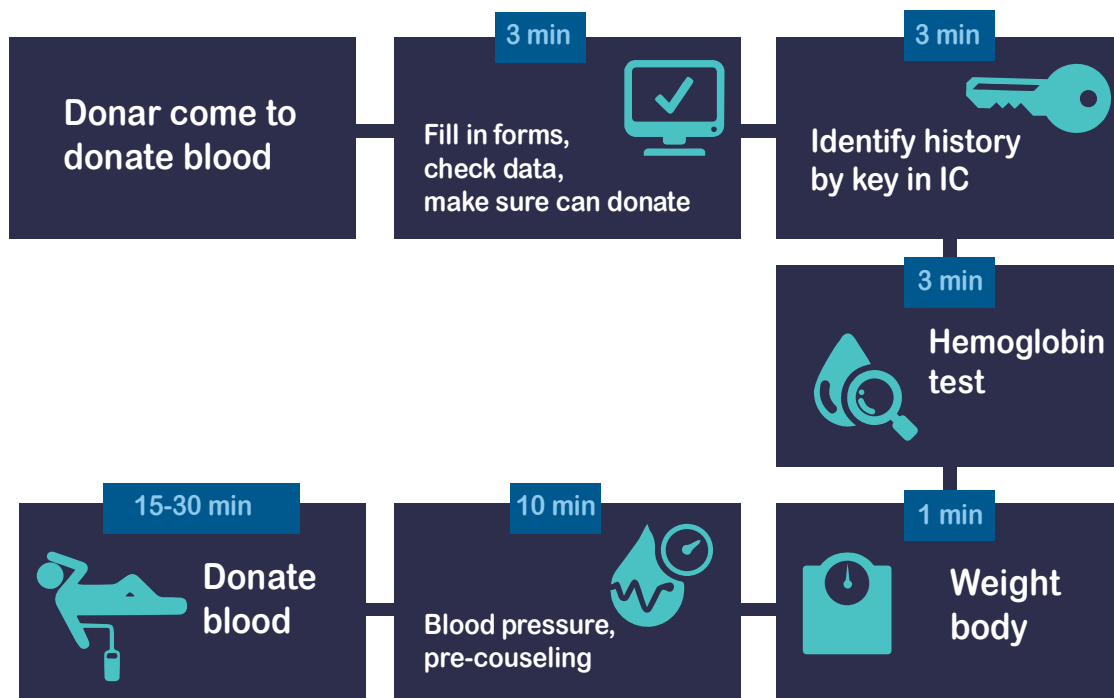


Figure 4.8 The result of journey map for service provider

4.5 Competitor analysis map

The competitor that involved in blood donation mobile apps are Redy, My blood (Pusat darah negara), Blood donor (Red Cross American) and Friend3support apps. Redy and my blood are local blood donation apps while blood donor and friend2support is oversea mobile apps. According to their strength and characteristic of each blood donation mobile apps, a competitor analysis map is formed. Basically each of them is focus on donor details such like blood donation history, donor identity, location navigation and so on. Majority of the apps are information base which is provide basic information location about the blood donation campaign nearby and lack concern about the interaction and communication between the donors. According to analysis map, most of apps are focus on the existing donor features and not focus on attract new user to use the apps.

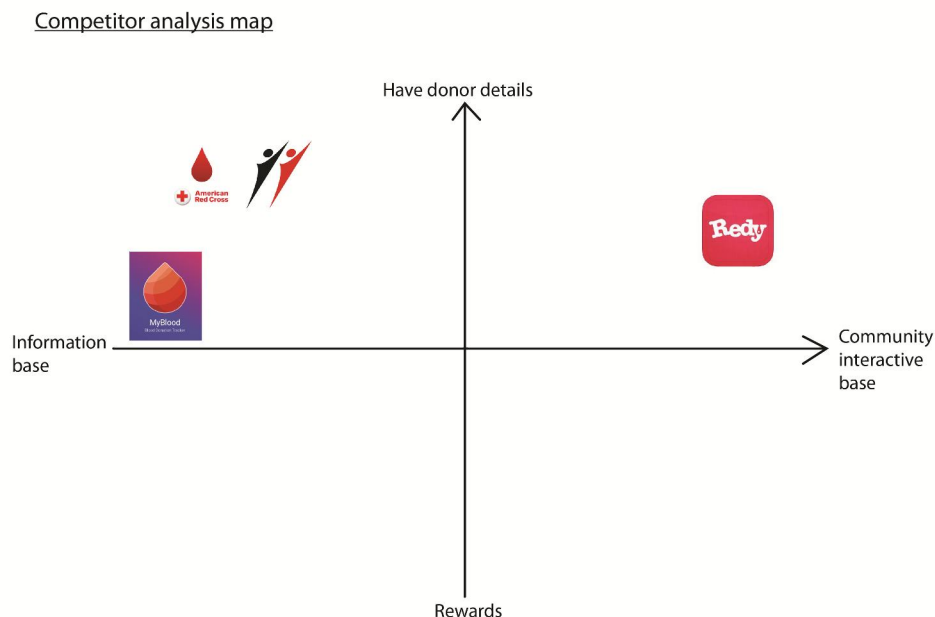


Figure 4.9 The competitor analysis map for blood donation apps

4.6 Visual Analysis

There are 4 type of blood donation apps involve in this visual analysis named Redy, MyBlood, Friend2support and American Red Cross. All of them analyzed with their interface design, color scheme, button& icon design and style.

According to the visual analysis, basically their interface designs are clear and simple. User will feel more user-friendly when the design is clean and tidy. Basically the colors that use in these apps are red color tone because it is represent the blood color. The button and the icon design are used simple design so that easy to understand by every user. But the styles that they used are different.


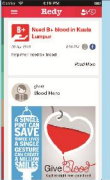

















logo	Interface design	Color	Button&Icon	style
	 			iconic style
	 			typography
	 			iconic style
	 			Photography

Figure 4.10 The visual analysis map for blood donation apps

CHAPTER 5

DESIGN PROCESS

5.1 Introduction

As a result of research and data analysis, the problems that had identified have to solve during the design process. All the identified problems and issues have to solve in design process. In this stage, will start with identify the purpose of design until the last. After the final design of interface is done, need to proceed to the prototype and app validation.

5.2 Concept Design

Concept design is the first stage of the design process, which the outlines of the function and form are related. This involves the design strategy, process, and experiences and so on. Hero mobile app visual researches are more towards medical feel and cool color schemes. This is because Hero app is more to medical field, so that user can feel the calm and steady feeling. The button and icon style is focus on iconic design while the graphic style is cartoonish feel.

Basically, the idea of design is come from mood board and visual references. Mood board is a collection of visual research which contains images, colors, patterns and so on to convey a mood or concept to the audience. The collected information will use as references before the ideation process. The mood board has created an identity about the look and feel about Hero app.

The icon design will add some medical elements on it while the color scheme will maintain the cool color but add contrast color to create some passion and breakthrough the traditional concept about medical apps should use dull and boring color.

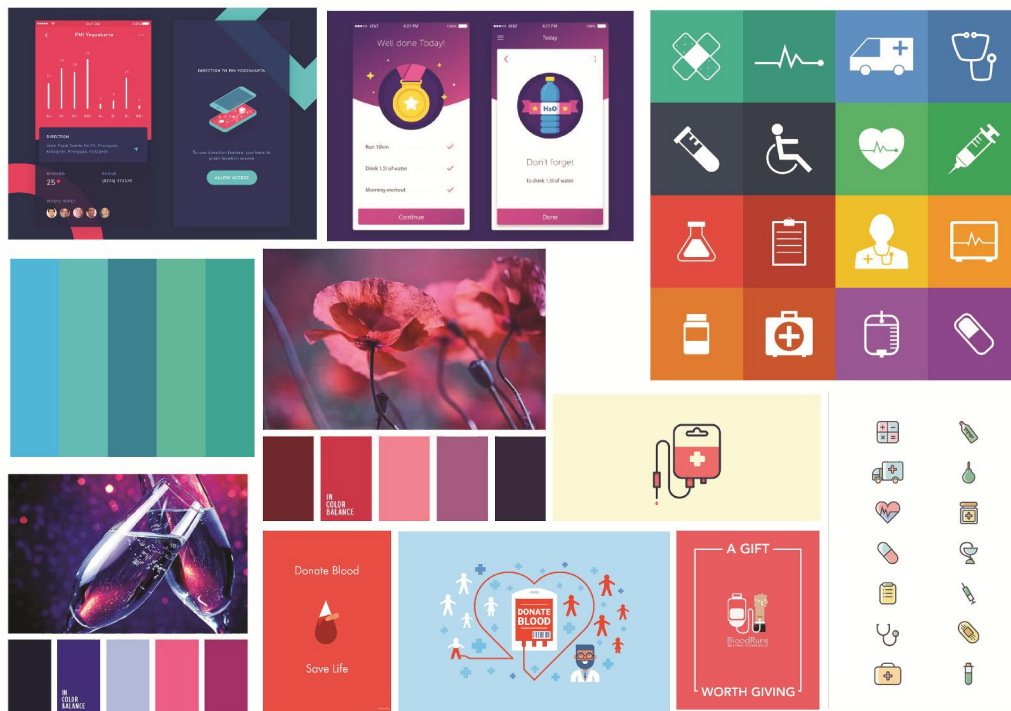


Figure 5.1 Mood board of visual research

5.3 User Task Model for Donor

Task model is related to show the logical activities for user to achieve their goals. For this reason, user task model for blood donation donor is the most important design deliverable; it will show the steps of users done, behavior and requirement at each of the stage.

5.3.1 Blood Donation Registration

The aim of this task model is to simplify the blood donation registration. According to the observation, the blood donation registration can be simplified to make the blood donation process faster and smooth. Even though the others information needs to fill in on site but the basic personal information can be skipped and no need repeated fill in every time. As this situation, a design is created which is online form for donor to fill in and the data is preserved inside their account and can change anytime.



Figure 5.2 Task Model of Donor Use Online Form to Fill-in Data

5.3.2 Emergency Case

From the feedback of the respondent in research, find out that public did not have a proper platform to share emergency case especially need rare blood type when emergency happen. Most of the people will share on social media only which is limited. So, design and build up a “donor social media” to assemble donors around in order to solve this kind of problems.

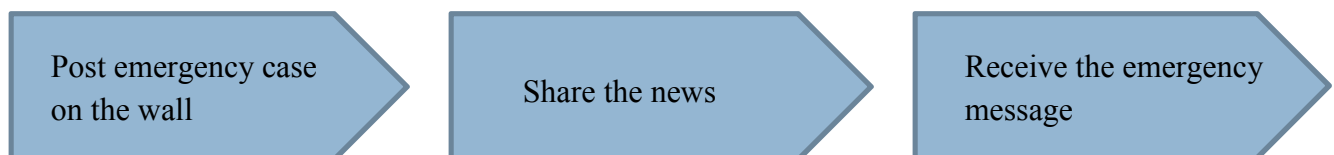


Figure 5.3 Task Model for Donor Share an Emergency Case

5.3.3 Event Notification

As the information from the research, user doesn't receive any news about the blood donation events and also not sure about the location and time of the event. Even though organizer spare the news by social media or poster but some people still don't know about the event. So that, design an event notification to remind public and also navigation of the location can bring convenience to user.

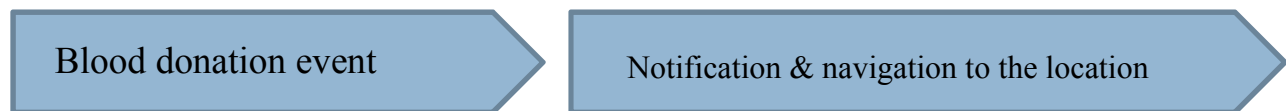


Figure 5.4 Task Model for Donor Get Notification about Blood Donation Event

5.3.4 Donation Rewards

Even though government provide rewards for donor, but not much people know about the government rewards is provided according to the donation times. The more times of donation, the more rich of rewards provided. Therefore, design a donation times to remind donor about their rights to receive government treatment after donate blood. In addition, rewards also can encourage and attract more donors.



Figure 5.5 Task Model of Donor Claim the Rewards

5.4 User Task Model for Service Provider

Service provider task model is also important design deliverable because it shows how the user behavior using Hero management app. Service Provider is regarding to provide a better and quality service to user. So that, user task model for service provider is concern about convenience and save time. Simplify the procedure of apps can make them more easy to function it.

5.4.1 Record Donor Data

The main reason to build up a service provider interface is to help them to record donor data. Every donor has to sign up and register before they proceed to donate blood for safety issue. Then, design an online database to record donor information can bring convenience to service provider.

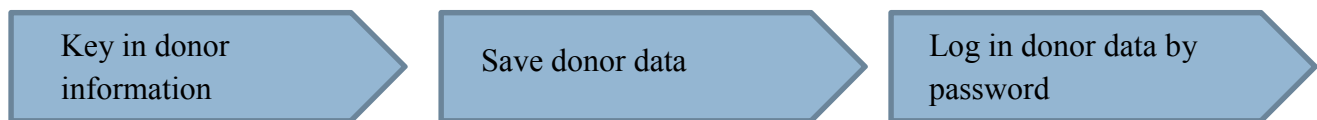


Figure 5.6 Task Model of Service Provider to Record Data

5.4.2 Scan QR Code

The goal of this task model has been set as service provider have to scan donor QR code to get their information straight away without typing any words. This design can help service provider to save time for key in donor basic personal information.

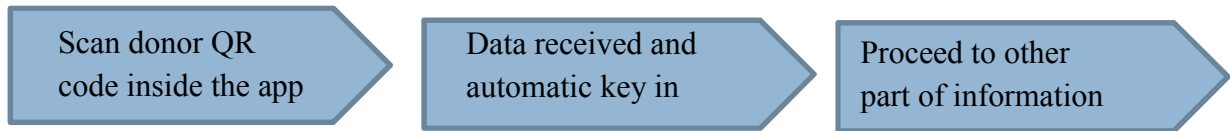


Figure 5.7 Task Model of Service Provider to Scan QR Code

5.4.3 Event Update

Service provider always updates their blood donation events on official website or social media. A simple template is provided for service provider to use to update news for donor in Hero app. Donor will receive their events once service provider update on their system.

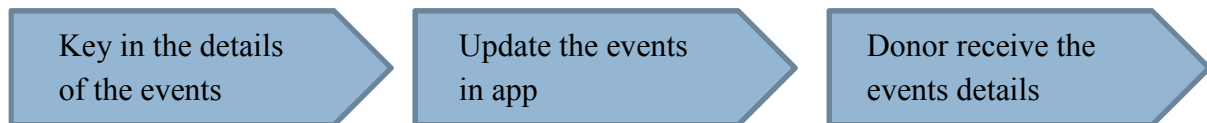


Figure 5.8 Task Model of Service Provider to Update Event

5.5 Design Development

Idea development is a stage of developing and generating new ideas and concept. The first step to start an idea development is mind mapping and brainstorming to analyze the idea. After that, sketch out the ideas and designs that need to apply in the layout design. Develop with different design and inspiration to find out the most suitable design to apply it.

5.5.1 Sitemap

Sitemap is a model of a website's content which designed to help user or service provider to navigate the site and better visibility about application operation. Sitemap can help to classify the complete blood donation mobile apps site content and page. This will make people more understanding about the flow of the whole blood donation and for search engines. Blood donation mobile applications contain two sitemap which are user sitemap and service provider sitemap.

The user blood donation mobile apps sitemap are basically follow the flow of the mobile apps which is logo and follow by landing pages and login register section before enter the main home page of the apps. Furthermore, there is also an addition menu sidebar from the home page that can access others features and pages in the mobile apps.

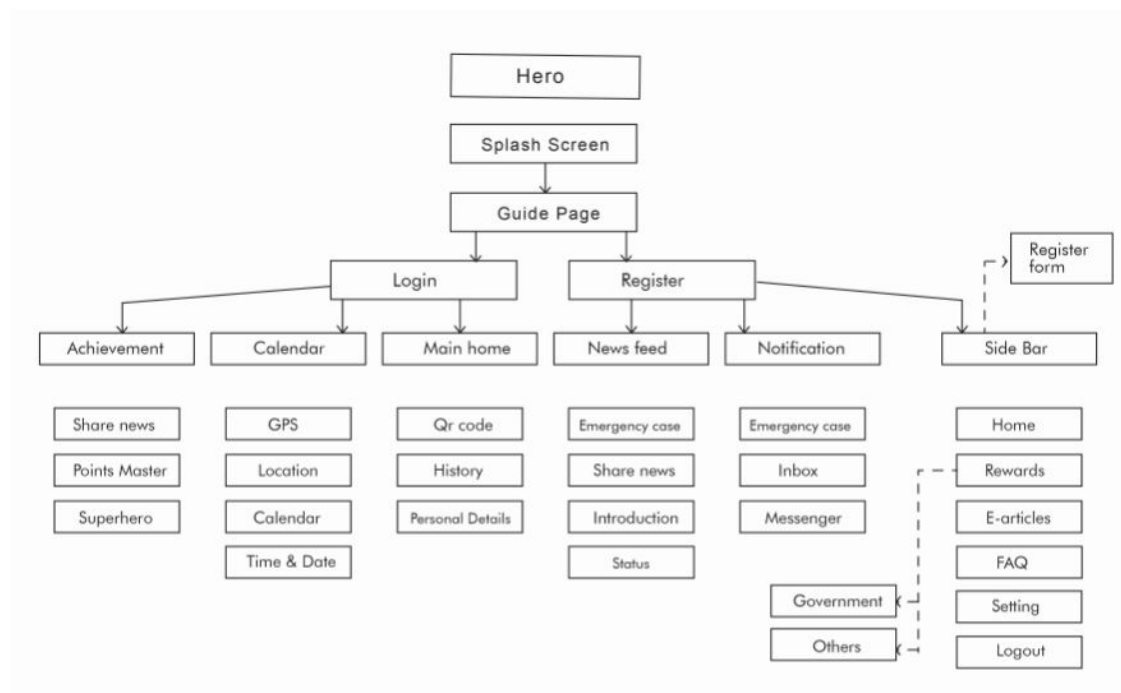


Figure 5.9 Hero user sitemap

Service provider sitemap is much simpler and direct compare with donor sitemap. This is because service provider needs a clear and direct search engine for recording donor data and also registration process. Simplify the steps can ensure service provider can navigate the site and have a better visibility when operate the mobile apps.

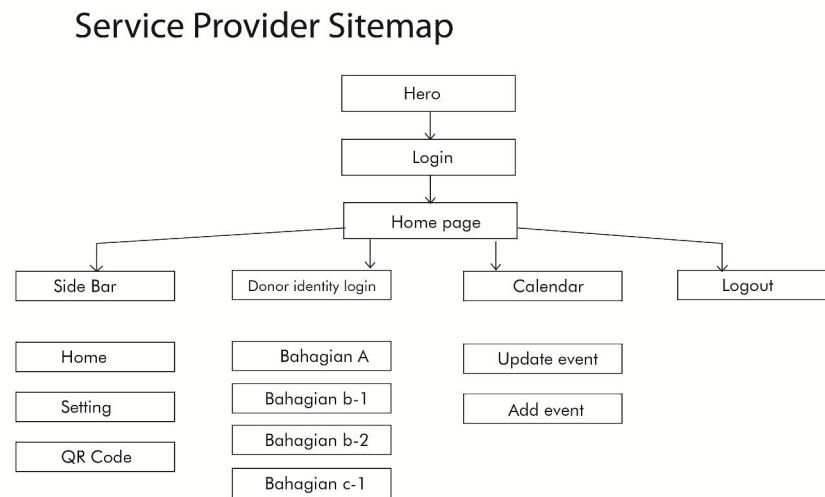


Figure 5.10 Hero service provider sitemap

5.6 Wireframe

Wireframe is set of images that display the functional elements of a page; it is used for layout content and functionality of a website or mobile apps. There are two wireframe for Hero apps which are user mobile app interface and also service provider wireframe for hospital staff.

5.6.1 User Wireframe

Hero blood donation mobile app basically included features and appearances that donor required and needed. The contents of “Hero” mobile app are much more rich information and interesting. New innovation features will give user a new experience on it.

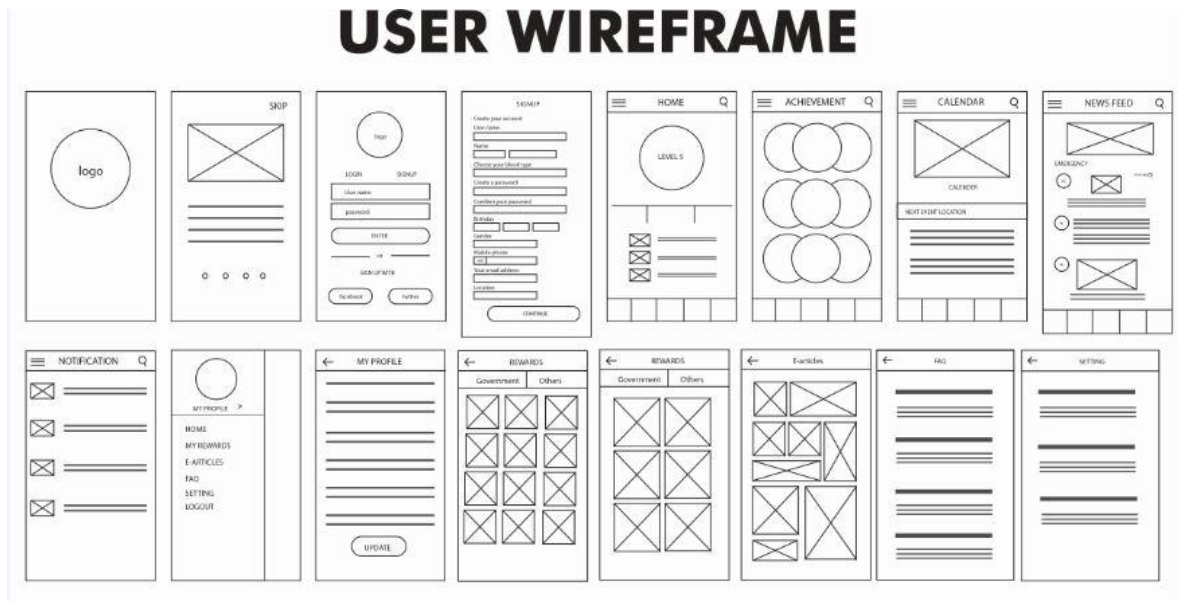


Figure 5.11 Hero user wireframe

5.6.2 Service Provider Wireframe

Service provider layout is much more simple and convenience. This is because sometimes staff nurse may have heavy workload during work, so simplify the design of layout will make their work easier. The interface just included some basic features that service provider needed.

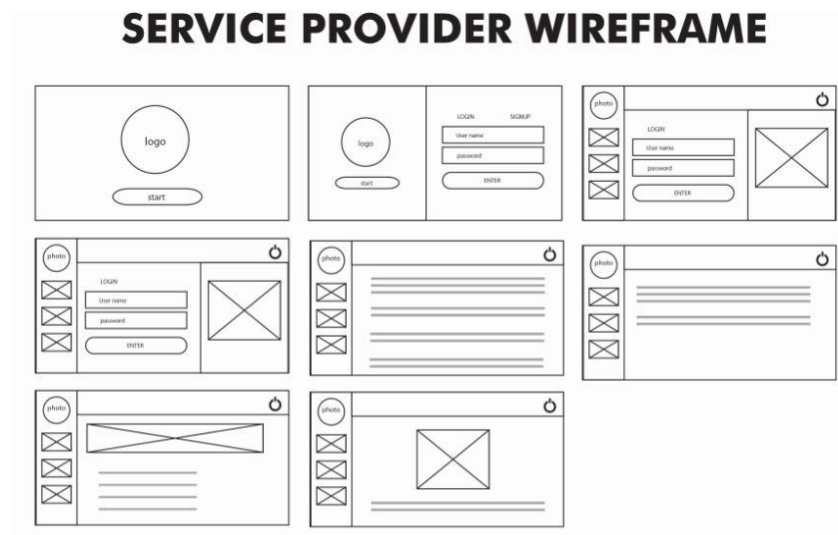


Figure 5.12 Hero service provider sitemap

5.7 Visual Design Proposal

The concept of design about “Hero” blood donation mobile apps is vector and illustration style. Illustration with clean lines and simplicity can be defined as a type of way to enhance your apps. Add on our own character and style into the apps can help to enhance and strengthen our brand’s appearance to stand out from others. (Ava, L.,2016). Build up a main character icon named HERO to make Hero app’s personality more clear and easy to be remembered.

Based on JustinMind (2017) said that legibility is very important and choosing the right font will affect the overall user experience of our web and mobile apps. So, Hero blood donation mobile app, use Futura Bk BT and Arial Rounded MT Bold san serif font in my mobile app.

5.7.1 Logo Character Design

This blood donation app named “Hero”. The reason why named it as Hero because it represents brave attitude identity to save people life just like a real hero save people when emergency. The logo color that use is red color. It is associated with energy, power and also determination spirit to help people.



Figure 5.13 Drafts Hero Logo Design

The final logo design is combination of typography with medical elements to bring out the identity of the blood donation.



Figure 5.14 Final Hero Logo Design

The main character of Hero app is inspired from a blood bag into a Hero. The reason to come out with Hero character is because wants to bring out the personality and style to grab the user attention.



Figure 5.15 Draft Character Design

The final character stands with this position because this position is more energetic and cheerful. The blood bag shape also becomes slim and healthy body shape to give an good impression for public.



Figure 5.16 Final Character Design

5.7.2 Button & Icon Design

The button and icon design is using the flat material icon to represent each of the section inside the app. The icons all are use blue and red color and add medical elements into the icon

design. The icon is using universal design because this type of icon is understandable and accessible to the user.



Figure 5.17 Side Button & Icon of Hero app



Figure 5.18 Main Button & Icon of Hero app

5.7.3 Color Scheme

The color schemes that use are basically blue and red color with different tones to make have layering feel. In addition, turquoise color is combination color of green and blue. Turquoise color is used because it has characteristic of calmness blue and the growth that represented in green which suitable for medical apps. It represent the feeling of healing and relaxing. Besides, red color tones also chosen because want to break through the medical apps use cool color as

representative color. Red color is representing brave and energetic, can bring some enthusiasm spirit for Hero app.



Figure 5.19 Color scheme of Hero app

5.7.4 Typography

The typography that chosen to use inside the Hero app are Futura BK Bt, Arial Rounded MT Bold and also Futura bold. The main reason that uses this kind of fonts is because san serif typography is readable and suitable to display in app.

ABCDEFGHabcdefgh123
ABCDEFGHabcdefgh123
ABCDEFGHabcdefgh123

Figure 5.20 Typography of Hero app

5.8 User Interface Design

User interface design (UI) focuses on ensuring the interface can be accessible and understandable by user. When designing the interface, the layouts have to be consistent and

predictable. For the layout design it should be a series of screens, icons, buttons and visual elements to make it unite. UI design should make the interaction simple and efficient as possible so that can bring convenient and easy to user for solving their problems.

5.8.1 Splash Page

It is a page of app that user will sees firstly before entering the home page of the site. Basically, it is use to promote and inform user about basic information for example what kind of software is necessary to view the site's page.

Hero app's splash page shows the company identity of icon and logo before entering the home page. This is a way to promote Hero app and be remembered.

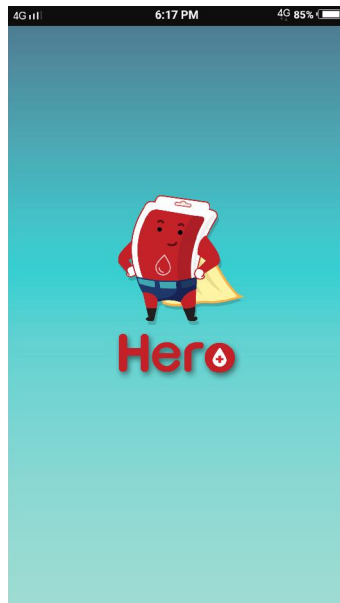


Figure 5.21 Splash Page of Hero app

5.8.2 App Guide

Hero blood donation app guide is related to introduce new user about what are the features that provided inside. The purpose of app guide is introducing the basic features of Hero app to new user so that they will familiar and understand more about this app. User can know about the features such as get the latest news about the emergency. There are also some features provided in this mobile app such as donate history, calendar schedule, rewards and so on.

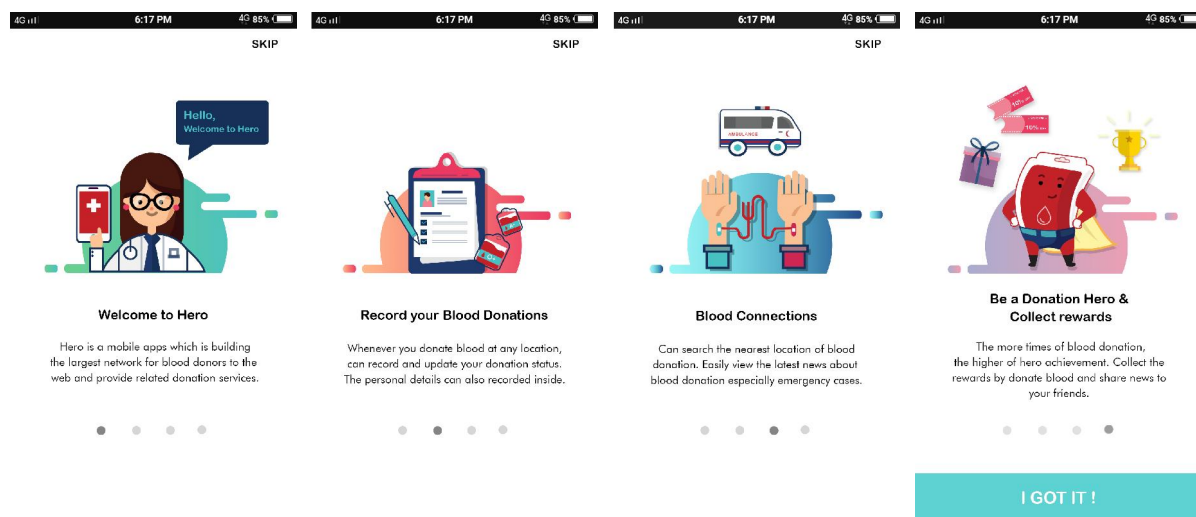


Figure 5.22 App Guide Pages of Hero app

5.8.3 Main Features

The important features of main page is providing donor to check for donation details and scan QR code during the donation to save time. Basic information such as blood donation history or donor identity also can check at the main page of the app.

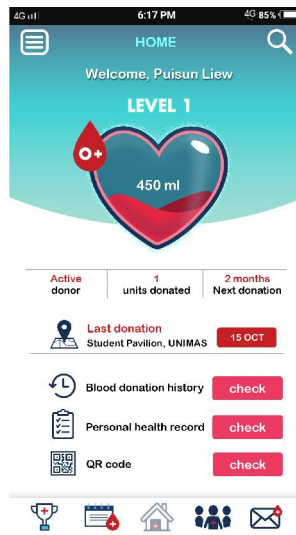


Figure 5.23 First Main Page of Hero app

The second page is about the achievements which donor can complete the mission to claim the points and redeem it with some vouchers and discount in “Reward” part. Calendar page is a reminder for donor about the details of nearest donation around and upcoming events. GPS navigation location also provided for donor to navigate.



Figure 5.24 Second and Third Main Page of Hero app

Next, News Feed page is a platform for donors to share their neither new nor information on it. When emergency case happened, donor also can post their status here to seek for help. The emergency case will automatic pop up at the top of the news. After that, inbox page is provided for public to have conversation with donor and notification will automatic sent to donor's inbox.

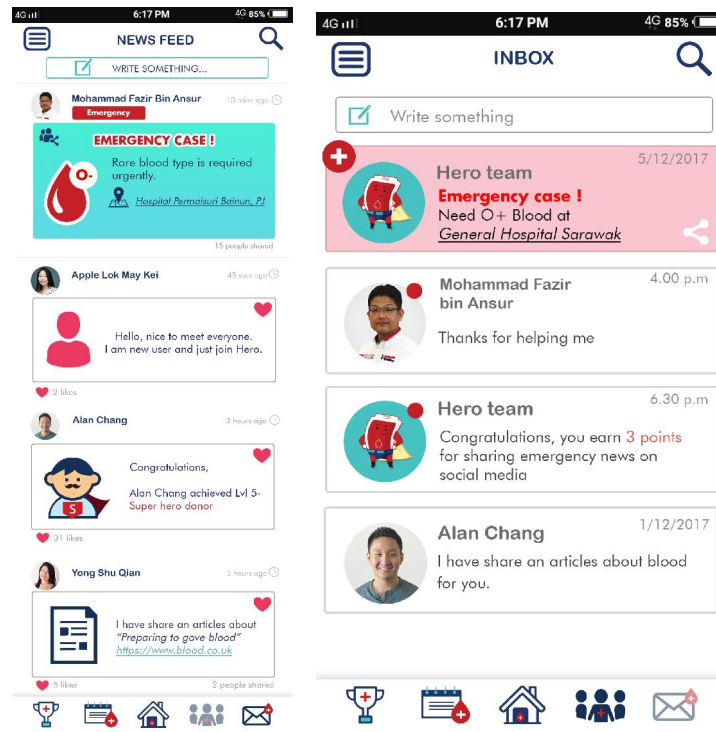


Figure 5.25 Fourth and Fifth Main Page of Hero app

5.8.4 Side Features

In brief, side features of Hero app have setting, FAQ and logout button for user. Furthermore, online blood donation form can be found on the side bar, donor can fill-in the

personal information forms before proceed to the staff nurse at blood donation campaign. When fill in the forms, service provider can detect it by scanning QR code.

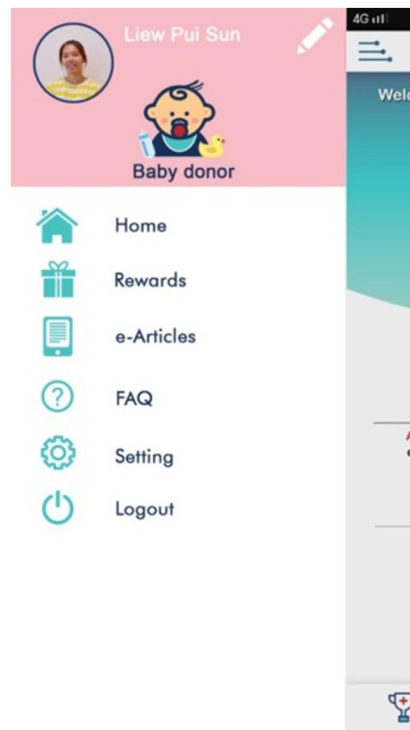


Figure 5.26 Side Page of Hero app

When donor donates blood at blood donation campaign, they can claim their points in the “Rewards”. There are two type of rewards can be claimed which are government official rewards and also other sponsors for outside. Points can be earn by donate blood, sharing news and read articles.

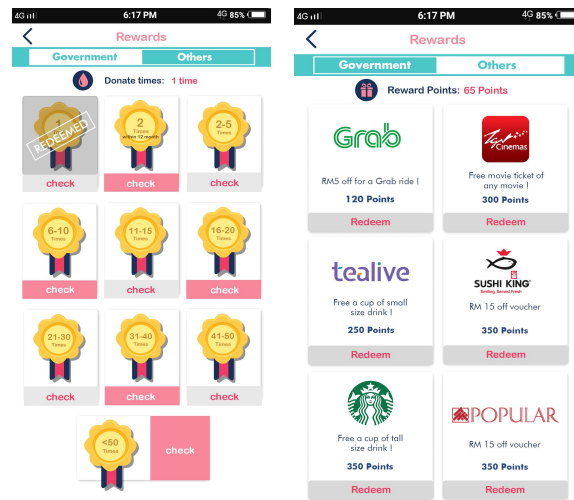


Figure 5.27 Rewards Page of Hero app

Besides, E-articles are a type of reading corner for user to broaden their knowledge and learn something new. Every day, E-articles will update new articles or news about healthy lifestyle and diet for user to read. If any problems or questions want to understand,



Figure 5.28 E-articles Page of Hero app

5.9 Service Provider Interface Design

Service provider is a section which implements service to users and the system make the implementations available to the user. Service provider app and donor app are synchronous with each other. Service provider interface is much more easy and simple because it can bring convenience to staff nurse to manage donor data during the blood donation.

5.9.1 Main Features

The main feature of service provider interface is can obtain donor personal data by scanning the QR code. Staff nurse just need to login donor identity and donor can check information in the app.

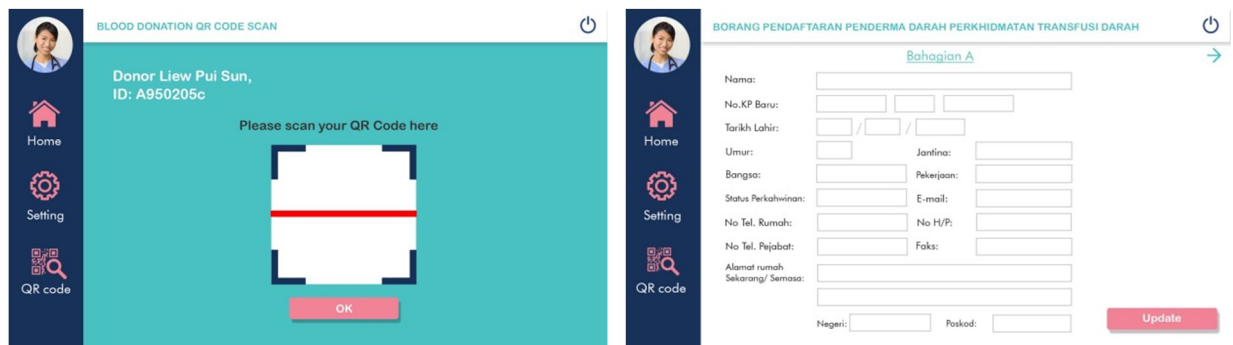


Figure 5.29 Main Features of Hero Service Provider app

Service provider also can update or add event inside the app while user can get the latest update or news immediately on their app. User can get the latest news once service provider update events or news.

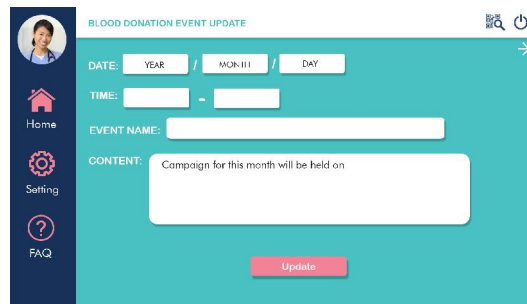


Figure 5.30 Event Update Page of Hero Service Provider app

5.10 Software and Prototype

The software that used to do the interface of Hero blood donation app are Adobe Photoshop and Adobe Illustrator. Both of them are used to illustrate and design the layout of each of the interface. After the interfaces are done, Marvel app is used to build up the clickable prototype by insert each of the interface on it. Marvel app can apply the movement and effects according to user opt.

5.11 Promotion and Strategy

Blood donation mobile apps in our society can be considered still not familiar and well-known by public. The main reasons why this situation happen is because public always be in touch with traditional walk-in blood donation which is involving many complex procedures and steps when donation. Therefore, promotion is very important because promotion is voice of our product which clearly and loudly sends out our brands message to the public. So, come out with different and creative promotional strategies can be used to promote and marketing our products

depending on our own objective. (Mishra, A.,2015). This will make people interested about your apps and search to download it.

5.11.1 Social Media and Apps Store

The first promotion strategy Hero blood donation mobile app used is social media. Social media is undoubtedly the most inexpensive way of promoting blood donation app like Instagram, Facebook and twitter. All of these can be considering is the best way to do viral, because it is free.

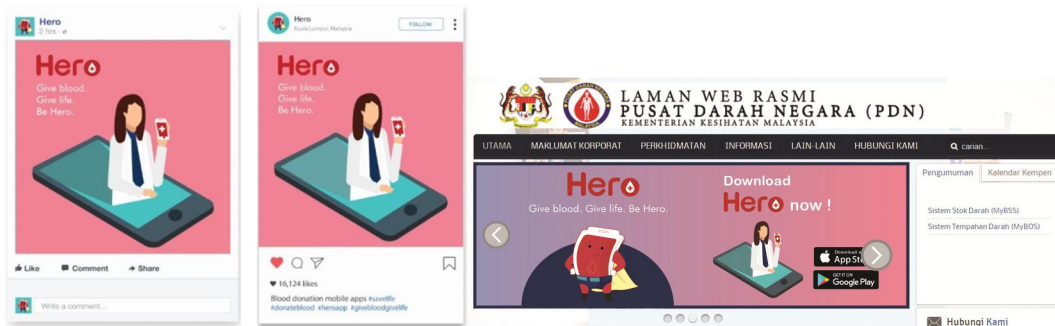


Figure 5.31 Social Media Advertising (Facebook, Instagram, Official Website)

Thence post some related post for example apps introduction poster or demo video can easily draw youth attention to try something new and download it. The viral video can briefly introduce the features and functions about Hero app.

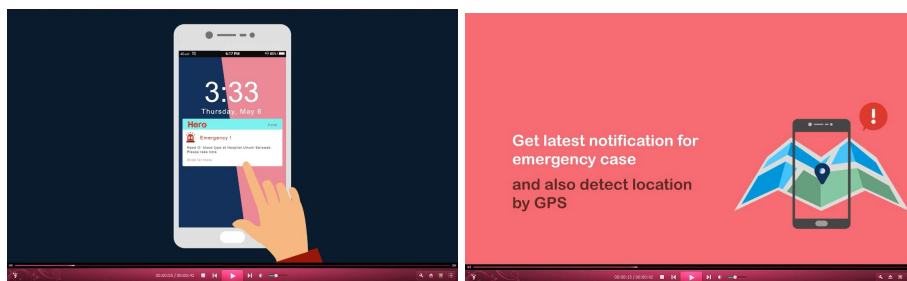


Figure 5.32 Demo video about Hero App

Government official website can release news about promotion of blood donation apps and launch it on website. Hero app also published on Google Play Store and App Store which provided demo video, apps guide, Hero app interface layout and so on. User can download it for free and can give a review or comment after use it. Build up a QR code brings convenience for public to download apps by scanning QR code in smart phone.

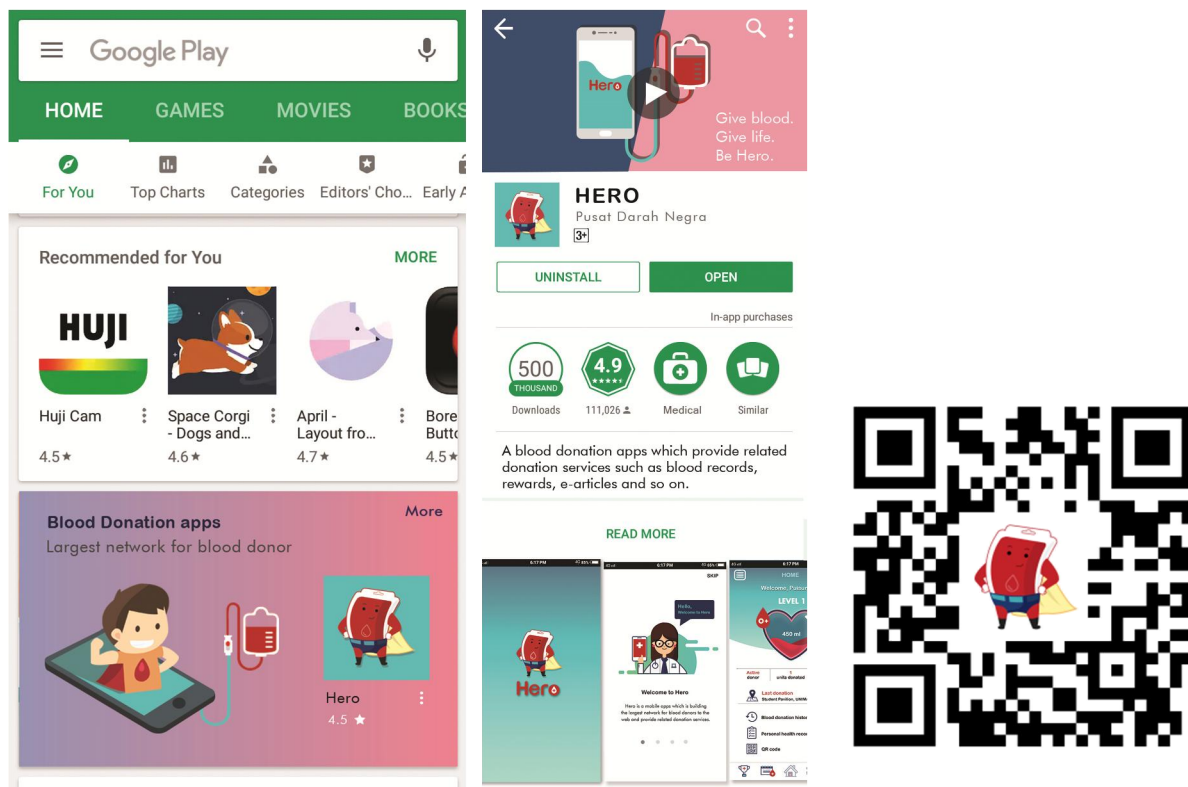


Figure 5.33 Apps store Advertising & QR code

5.11.2 Traditional Advertising

Traditional advertising can be considered as one of the most effective promotion strategy. Ambient advertising on billboard, Hospital blood bank or blood donation campaign can grab public attraction by create some interesting and creative ideas. This type of promotion can be considered as running promotion to get users to download it. A clear informative info graphic about blood donation is powerful because it becomes a visual tool to convey blood donation information into understandable information to audiences. During the blood donation campaign events, brochures and booklet will be distributed at the blood donation booth or Blood Bank. All that brochures and booklet are all related to features and information of Hero blood donation apps. Furthermore, the display of cardboard cut-out “Hero” cartoon will make public more easily attracted because visual elements can grab their attention to look for it compare with texts. Especially display on the donation booth or blood donation location can help to increase “Hero” cartoon existence feel.

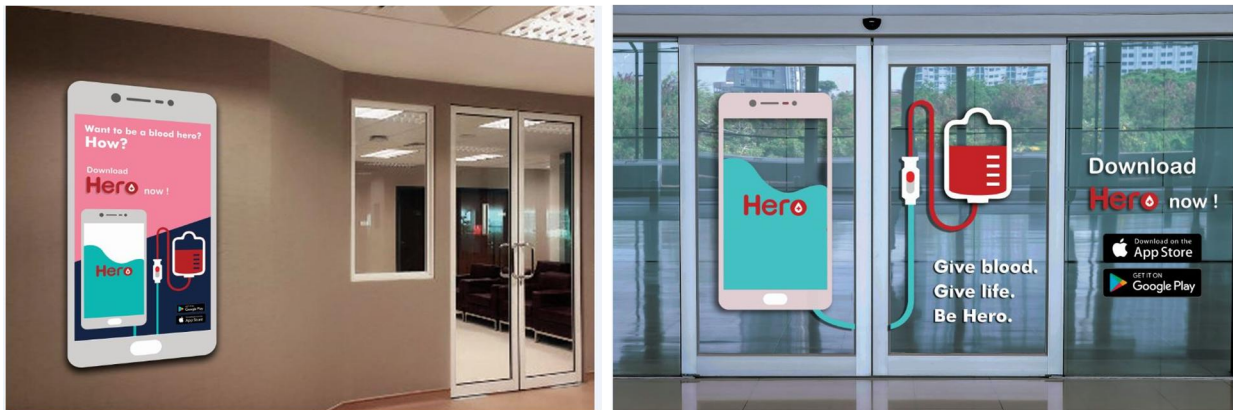


Figure 5.34 Traditional Advertising (Ambient)



Figure 5.35 Traditional Advertising (Brochures)

5.11.3 Merchandise

Use merchandise as corporate gifts can spread the idea and increase the awareness of Hero apps brand identity. By giving the gifts with our apps name, logo and information, it can raise Hero apps branding by keeping our apps “front of mind” to be remembered. Therefore, Hero mobile apps come out a set of merchandise named “Hero box” which contains a bottle of mineral water, towel, healthy snacks and thank you card. “Hero box” not just offered donor as souvenir but also a way of promoting “Hero” mobile app for garnering public attention.

During the blood donation, small items of free gift also will be distribute to donor when donate blood such as badge, notebook, and postcard will be distributed. When donor receive free gift, we can create a positive perception from the donor to improve our brand’s image.



Figure 5.36 Merchandise items

5.11.4 Collaboration

Hero blood donation mobile app has cooperation with Grab enterprise to encourage more donors to donate blood by giving a discount rides to and from Pusat Darah Negara. Furthermore, collaboration with Pusat Darah Negara during the blood donation campaign to build up the awareness of blood donation and also encourage Government staff to use the apps as service provider.



Figure 5.37 Grab discount voucher

CHAPTER 6

VALIDATIONS

6.1 Validation

Design validation is about used to identify the final design outcome during the end of the product development to make sure that the consistency and completeness of design is fulfilling the user requirement (Guru99, 2018). So that, design validation has to prove with objective evidence such as image, text or prototype to indicate the procedure is accomplished. The process of design validation involve testing, examine and analysis.

There are many principles for design validation. Firstly, validation design can be identify by detailed the design data which represent the final user requirements. Next, documentation each of the activity during validation to prove that the design fulfill user requirements. Validation also needs to capture the differences between the outcome and user needs. Lastly, when there are changes during the validation design, it should be revalidating the activity again.

As conclusion, design validation is a process that helps to prove the final design is a proper and right product or software. This will ensure that neither customers nor user will satisfy about it.

6.2 Method

The design validation is done by giving user and service provider to test use the prototype app. Donor and hospital staff nurse as test subject to use prototype app. Respondents will ask about the rating according different sections about the prototype. There are 10 donors and 5 staff nurse are received this Q&A sections.

6.3 Findings

Overall, the results from respondents are giving a positive feedback about the Hero prototype. Most of them are satisfy about the features and think that it is very helpful and bring convenience to them. Moreover, it has validated that Hero mobile app prototype is success and fulfill the market needs.

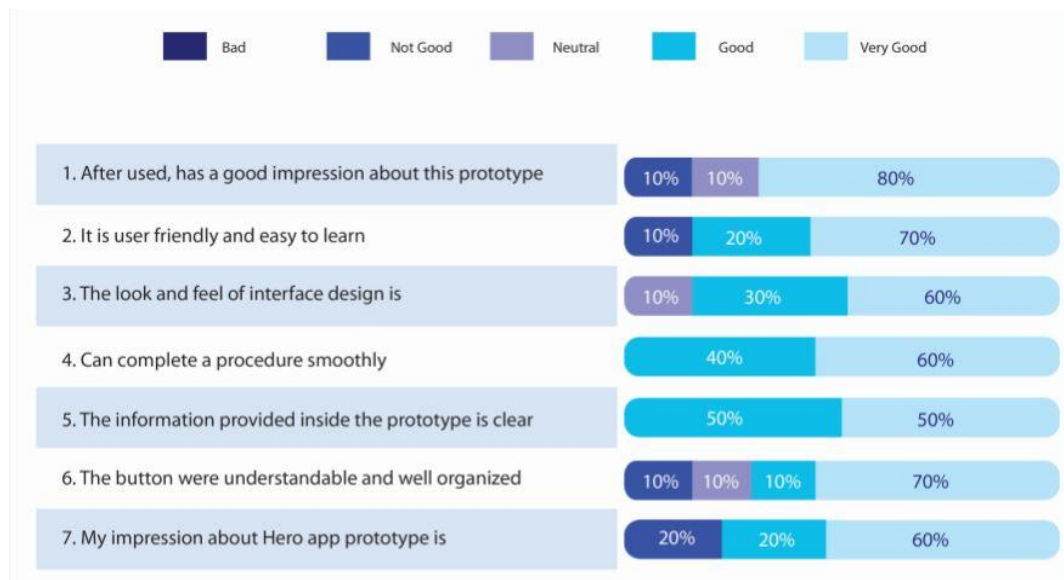


Figure 6.1 Result of validation

CHAPTER 7

RECOMMENDATION & CONCLUSION

7.1 RECOMMENTATION

Based on the findings with user and service provider about the design of Hero blood donation mobile app, they have provided some recommendation and improvement about the app. Blood donation donor basically satisfy about the features and functions about the Hero mobile app. They prefer the look and feel of the app design. Service provider commented about the design of the app are find and favorable. But staff nurse has stated that the technique part about the donor information need to further improve if wants to establish the app. This is because the donor privacy information is very important and need a comprehensive protection to make sure their personal data is protected.

7.2 CONCLUSION

Research and study can help to figure out the problems and issues that donor and service provider faced during the blood donation. Besides, some features also included inside the app according to the survey and research to the target audience. So, build up Hero mobile app can help donor simplify some steps such as fill in forms and create a platform for public to share news about emergency case.

Blood donation is very important because it not just can save life but also help people to change the life. Even though, the main purpose of buildup Hero blood donation mobile app will bring convenience for donor to simplify the blood donation process, but also hope to attract public to join blood donation. As we know, the awareness of blood donation still very low among Malaysian. So, there are some interesting and beneficial features such as E-articles and Rewards hope can inspire non-donor interest to join blood donation. A gamification features on achievement can encourage more user to get involve on blood donation campaign while download Hero mobile app. So, it is important to do marketing promotion to Hero app for grab the attention of the pre-occupied customers. Promoting Hero app can increase the brand awareness which attract people to find out more information about us. This can help us in increasing customer traffic.

As a conclusion, according to the feedback from validation, the features and interface design of Hero blood donation mobile app is suitable and good for donor and service provider. In the future, hope “Hero” can has further development and collaboration with Pusat Darah Negara as service provider to build up blood donation awareness among Malaysia to create a selfless society.

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Interview Survey Form (Donor)

Section A: Background

Name:

Gender:

Age:

Occupation:

Section B: Blood donation

1. Which type of donor you are?

() Non-donor () Non-active donor () Regular donor

2. (i) If you are not a donor, what is the reason you hesitate to donate blood?

(ii) If you are a donor, what motivate you to join the blood donation?

3. How do you know about the blood donation campaign?

4. What problems do you struggles during the process of blood donation?

Section C: Opinion

1. Have you heard about blood donation mobile apps?

2. Have you use the blood donation apps before? What your opinion about it?

3. Do you think that blood donation mobile apps are useful and can bring convenience?

Interviewee A

Background

Tuan Nor Fazilah Binti Tuan Hussin

Female

23

Student

Section B: Blood donation

1. Non-active donor
2. (i) no
(ii) want to help people
3. non-government event
4. fill the forms need some time

Section C: Opinion

1. Yes
2. No use before so don't know
3. Yes, can let people know more news and information

Interviewee B

Background

Safiah binti Basri

Female

26

Self-employee

Section B: Blood donation

1. first donor
2. (i) no

- (ii) Save people who need blood
- 3. social media and pass by at the event
- 4. no privacy and too much question

Section C: Opinion

- 1.No
- 2. No use before so not understand
- 3. Yes, to make the process more smooth

Interviewee C

Background

Tiang Siok Hong

male

40

engineer

Section B: Blood donation

- 1. regular donor
- 2. (i) no
 - (ii) help people and think to contribute to society
- 3. regular go hospital donate but if met event will join also
- 4. sometimes long line up but still ok

Section C: Opinion

- 1. Heard before and saw on app store about this kind of apps
- 2. No, but think if have is good for society
- 3. Yes, good and useful

Interviewee D

Background

Tey Sin Reow

female

23

student

Section B: Blood donation

1. regular donor
2. (i) no
(ii) help people and good for health
3. go hospital to donate regularly
4. is ok

Section C: Opinion

1. yes
2. I saw on app store and download it, but no long I uninstall it because boring
3. Yes, if interesting enough will download it to use

Interviewee E

Background

Vivian tan

female

20

student

Section B: Blood donation

1. regular donor
2. (i) no
(ii) help people and can get free gift

3. online
4. need to wait for turn

Section C: Opinion

1. Heard before and saw on app store about this kind of apps
2. No, but is good if can help people
3. Yes, can provide more information to people

Interviewee F

Background

Lilian

female

24

work

Section B: Blood donation

1. first time donor
2. (i) people said donate blood not good for health
(ii) online reading about benefit of blood donation,so join it
3. saw poster around
4. need to wait only, still ok

Section C: Opinion

1. No, never heard before
2. No, if can make the procedure more smooth, why not?
3. Sure, if can share the location or news

Interviewee G

Background

Chan shuk teng

female

22

student

Section B: Blood donation

1. non-active donor
2. (i) no
(ii) is good campaign and good for everyone
3. Advertising on FB and poster
4. need to wait only, still ok

Section C: Opinion

1. No, never heard before
2. No, if have this is good.
3. can help people to notice about blood donation campaign

Interviewee H

Background

Mohd Ariff bin AB Kadir

male

36

Government functionary

Section B: Blood donation

1. non-active donor
2. (i) no
(ii) help people and save life

3. not regular donor, but if pass by an event will join
4. no problem

Section C: Opinion

1. No
2. Welcome it, it can provide more information.
3. Sure, especially emergency case, it is very useful.

Interview Survey Form (Blood donation Service Provider)

Section A: Background

Name:

Gender:

Age:

Job Scope:

Section B: Blood donation

1. What type of media do you use to promote blood donation campaign?

2. When emergency cases happen, how to promote public to collect blood?

3. What problems do you faced during the blood donation process?

4. Is the process during blood donation is smooth or not? If not what cause this to happen?

Section C: Opinion

1. What do you think about blood donation mobile apps?

2. Is there any follow-up conducted to the blood donor after the blood donation section?

3. Do you think that blood donation mobile apps is useful and can bring convenience?

Service provider interview 1

Background

Nuesaibah Wan Zulkipil

female

28

Medical officer (pre-counseling doctor)

Section B: Blood donation

1. Mainly use Fb, Twitter, radio, newspaper or during festival like Hari Raya blood bank blood reduce and need to promote
2. Newspaper, and contact donor records to call them to help to donate
3. some people not fulfill the criteria like medication or sick
4. Sometimes might crowded a bit but still under control

Section C: Opinion

1. Don't know because Sarawak don't have
2. Encourage people to come back to donate after 130 days
3. Yes, because everyone now use smart phone

Addition notes:

Job scope: ask about medical condition because infection can't be detected, donor need to conscience about their body condition so that won't harm others blood receiver.

Service provider interview 2

Background

Tauti Bt Sipi

female

34

Staff nurse

Section B: Blood donation

1. we have official Facebook to promote
2. Newspaper, advertisement and radio
3. Donor need faster and need to line up sometimes
4. Not enough space for donor sometimes, need to wait more loner time, donor faint

Section C: Opinion

1. Don't know
2. is good because have information about blood donation
3. Yes, can be promoted to let more people know

Service provider interview 3

Background

Shanti

female

18

PBSM SMK Kota Samarahan (Event organizer)

Section B: Blood donation

1. we have Facebook to promote the event
2. no
3. People waiting for donate sometimes
4. Space is limited sometimes because the location is not good

Section C: Opinion

1. Don't know
2. Useful and nice
3. Yes, should let more people know because they can know more upcoming event

APPENDIX 3

Donor/ Service Provider Interface Validation

	1	2	3	4	5
1. After used, has a good impression about this prototype					
2. It is user friendly and easy to learn					
3. The look and feel of interface design is					
4. Can complete a procedure smoothly					
5. The information provided inside the prototype is clear					
6. The button were understandable and well organized					
7. My impression about Hero app prototype is					

1= Strongly Disagree

2= Disagree

3= Neutral

4= Agree

5= Strongly Agree



Compilation of donor empathy map

Journey Map

Donor= Safiah Binti Hasnan, 23 years old, student
 Note: Observation donor donate blood at Summer mall

Pre-Blood Donation Period	Donation Period	Post Blood Donation Period
-Donor come -staff nurse ask them question Eat your breakfast? What is your weight? Donated before? What is time of period?	SERVICE JOURNEY Fill in forms 5min → Hemoglobin test & blood test 5min → Blood pressure test pre-counselling section 10min ↓ Give red book wait for calling 5min ↓ Donate blood 20min → Take a rest 15min → Staff nurse check again and give some advice 5min ↓ Take refreshment 5min → Go back	-Nurse tell her can donate again after 3 months, rest more, no heavy staff, no exercise
Service provided -Body weight measurement		Service provided -food refreshment -Nurse advise
Experiences: Pain but excited	Expectations: Good experience than expected	Satisfaction: Proud, will donate again, ok

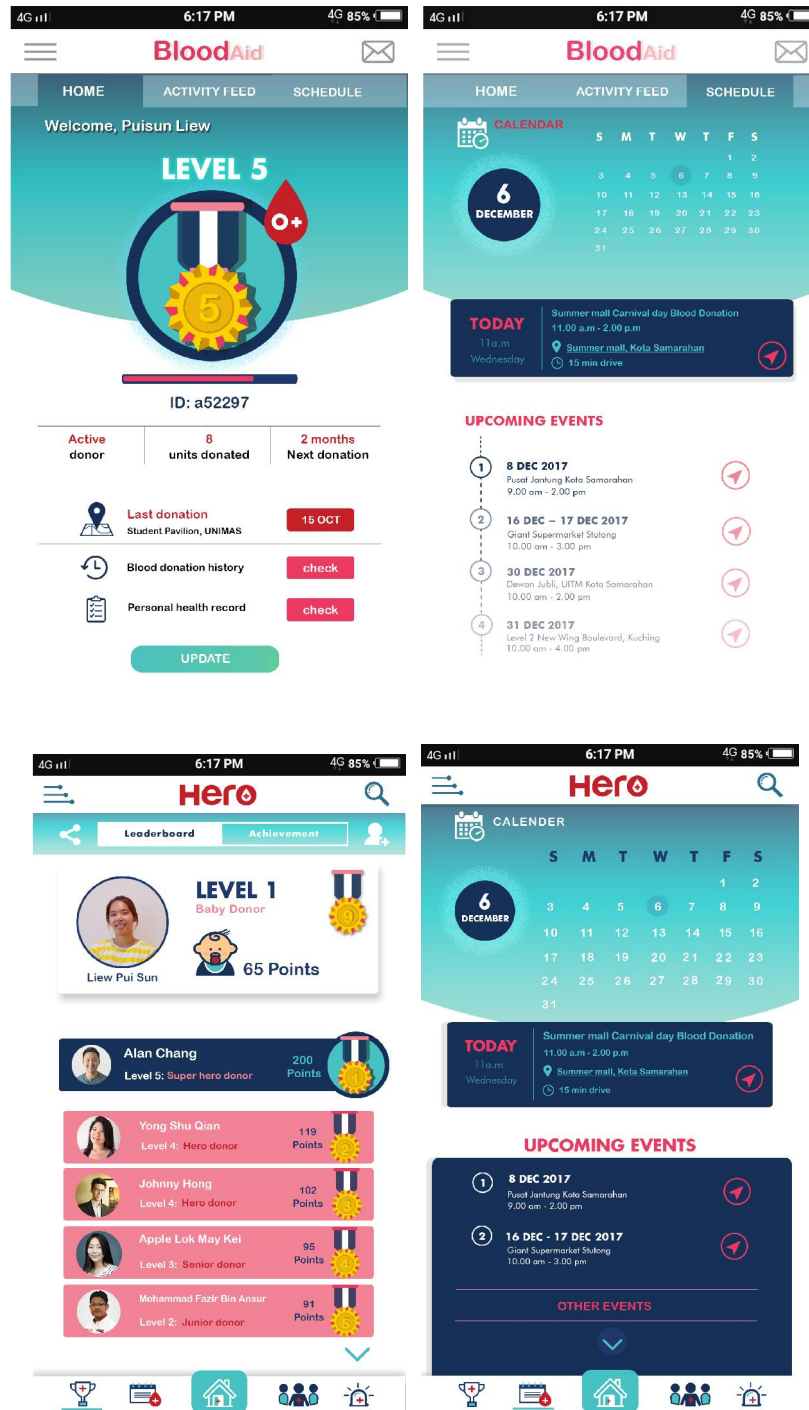
Compilation of service provider empathy map

Journey Map

Note: Staff nurse complete a registration procedure in Blood bank

Pre-Blood Donation Period	Donation Period	Post Blood Donation Period
<p>-staff nurse ask them question Eat your breakfast? What is your weight? Donated before? What is time of period?</p>	<p>SERVICE JOURNEY</p> <pre> graph LR A[Donor come] --> B[check their ic whether is active or not in computer] B --> C[If OK can proceed if rejected, cannot proceed] C --> D[Hemoglobin test] D --> E[Check body weight blood pressure] E --> F[Pre- counselling] F --> G[Donate blood] </pre>	<p>-Nurse tell them can donate again after 3 months, rest more, no heavy staff, no exercise</p>
<p>Service provided -Body weight measurement</p>		<p>Service provided -food refreshment -Nurse advise</p>
Experiences:	Expectations: They are professional	Satisfaction:

Design Development 1



Design Development 2

